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PROCEEDINGS OF THE 57<sup>th</sup> ANNUAL MEETING OF THE



# Entomological Society of Alberta

November 5-7, 2009  
Vermilion, Alberta

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## Entomological Society of Alberta Board of Directors for 2009

### ESAB Officers:

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## Annual Meeting Committees for 2009

Meeting Chair ..... Brian Van Hezewijk  
Local Arrangements Committee..... Peter Walsh  
..... Michael Crowe  
Program Committee .....Lloyd Dsdall  
..... Alec McClay  
Registration and Budget Committee ..... Kimberly Rondeau

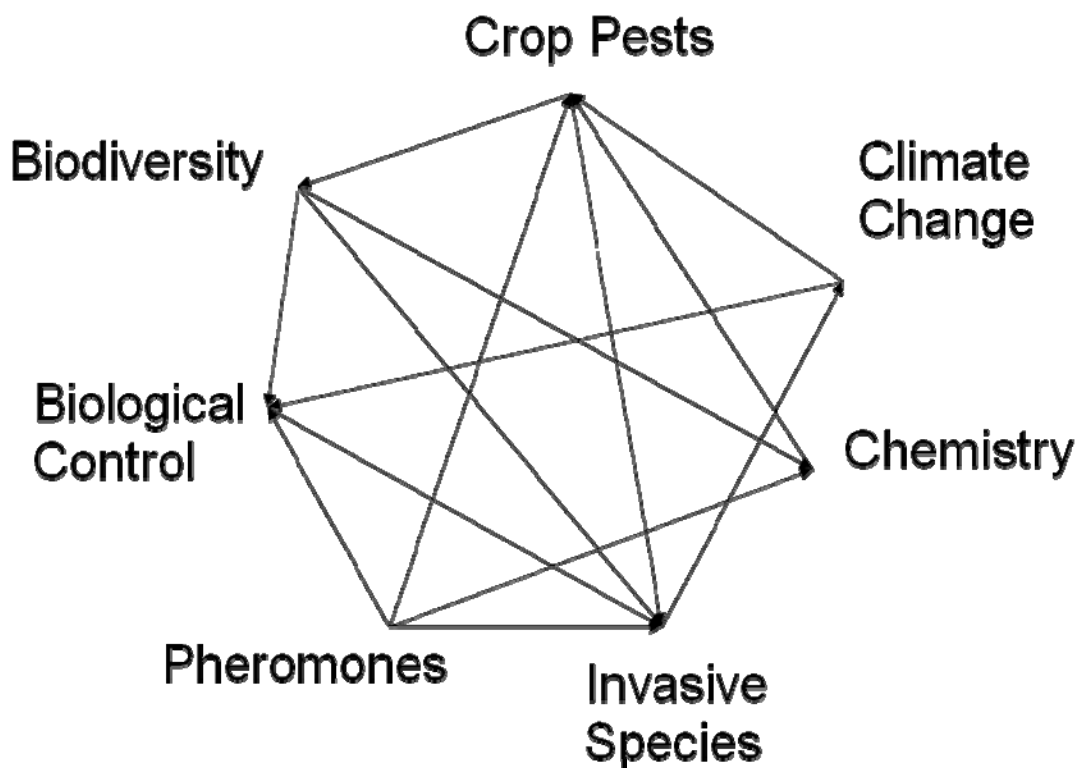
## President's Address

Welcome today to the 57<sup>th</sup> Annual General Meeting of the Entomological Society of Alberta. Reflecting back on this term as president of the Society, I'll leave it to others to decide the utility of my contributions but I feel that I have gained a lot more from the experience than I have given. Being immersed (and sometimes completely submerged) in the machinations of the society has taught me a great deal about how effectively people can work together to accomplish a common goal. In this I am speaking particularly of our Executive and Board of Directors, all volunteers, who take the time out of their busy lives to each complete their individual or committee work. For this contribution I'd like to personally thank them now, but also to give us all a chance to formally acknowledge their contribution. It has also taught me how rewarding it can be to be part of such a team and would encourage other young members here today to consider a position in the society as well. I, at least, should stand as proof that prior experience is not a prerequisite.

I would also like to specifically thank our organizing committee for the very successful meeting, especially Peter Walsh and Michael Crowe, our local arrangements chairs, for their accomplishments in providing for us a very enjoyable conference here at Lakeland College. I suspect that the only regret that many of will share, is that we will not have longer here in Vermilion to fully appreciate all what it has to offer. I would also like to thank all the students and staff here at Lakeland College for their gracious hospitality that has made us all feel very welcome.

On a sadder note I would also like to take this opportunity to remind us all of the passing of Ernest Mengersson and Graham Griffiths this past year. Both these men were very influential in entomology in the province and will be sorely missed by many of us. Perhaps we can pause for a minute to remember them and all those who have contributed to our society in the past. However, entomologists, like the insects they study, always seem to leave descendants, and as I look at our society here today I see many young faces that will soon be having substantial impacts on the field of entomology as well.

Looking back on the presentations that we have seen yesterday and today I was struck by how diverse, yet inter-related, they were. Here I've outlined what I think are the broad categories that we have covered in the past 36 hours.



Then I began connecting multiple themes that were covered in the same talk such as Maya Evenden's talk on pheromones and crop pests, but using that same talk we can also draw a link between pheromones and chemistry here. With Hector Carcamo's talk we can draw a link between crop pest and biodiversity but also to invasive species like *Pterostichus melanarius*. From there it is just a short hop to climate change through Ross Weis's presentation. And so on, and in the end what are we left with - no not a carabid - but a web. And I believe that it is through this interconnected web of ideas that we gain new insights into how the world works. This year marks the 150<sup>th</sup> anniversary of Darwin's great idea, and I don't think he came to that idea by only looking at the beaks of finches, or barnacles, or earthworms. I believe that he came to that idea by integrating geology with biology and also ethology and climatology and then cleverly spotting the intimate links between these seemingly diverse disciplines. I think it is our challenge for the future to cultivate and nurture these links so that we can make the entire web more resilient. And that is why I think these meetings are so important.

Thank you. I wish you all the best in the coming year and look forward to seeing you all next year in Lethbridge.

Brian van Hezewijk

# Program of the 57<sup>th</sup> Annual Meeting of the Entomological Society of Alberta

## Thursday, November 5, 2009

- 16:30 Executive Meeting (Room 256, Alumni Hall)  
18:30 Registration open (Cafeteria, Alumni Hall)  
19:00 – 22:00 Reception (Cafeteria, Alumni Hall)
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## Friday, November 6, 2009 – Main Theatre, Alumni Hall

- 08:00 Registration open (Hallway, Alumni Hall)  
08:30 Opening and Welcome

### **SYMPOSIUM: INSECTS IN AGRICULTURE**

- 08:40 **Introduction to the Symposium**  
Lloyd Dosdall (Moderator)
- 08:45 **Pheromone-based Management of Agricultural Pests: Current Research and Future Needs**  
Maya Evenden, Gries, R., Aurelian, M., Dosdall, L.M., Judd, G., Miluch, C., and Wins-Purdy, A.
- 09:05 **European Insects as Potential Biological Control Agents for Common Tansy (*Tanacetum vulgare*) in Canada and the United States**  
Alec McClay, Gassmann, A. and Wolf, V.C.
- 09:25 **Bio-climatic Approaches to Assess the Potential Impact of Climate Change on Insect Populations in Agroecosystems**  
Ross M. Weiss and Olfert, O.
- 09:45 **Climate Change Effects on Rangeland Soil Microarthropods**  
Jeffrey Newton and Proctor, H.
- 10:05 **COFFEE**
- 10:35 **Biodiversity in Agroecosystems: New Developments and Research Needs**  
Héctor A. Cárcamo and Olfert, O.

10:55 **Invasions of Insects in Agroecosystems in the Western Canadian Prairies: Case Histories and Patterns**

Lloyd Doslall, Cárcamo, H.A., Olfert, O., Meers, S., Hartley, S., and Gavloski J.

11:15 **Short Break**

11:30 **Lakeland College Student Activity: “Insect Jeopardy”**

12:30 **LUNCH**

### **CONTRIBUTED ORAL PAPERS SESSION 1**

Moderator – Kateryn Rochon

13:30 **Development of a pheromone-based monitoring tool for the red clover casebearer (*Coleophora deauratella*) in Alberta**

Mori, B.A., Gries, G., Otani, J., Yoder, C., and Evenden, M.L.

13:45 **Semiochemical-based mass trapping of the apple clearwing moth (Lepidoptera: Sesiidae)**

Aurelian, V.M., Evenden, M.L., and Judd, G.J.R.

14:00 **The effects of soil nitrogen, *Rhizobium* inoculation and insecticide seed coatings on yield loss and nitrogen fixation in field peas under *Sitona lineatus* attack**

Vankosky, M.A., Cárcamo, H.A., and Doslall, L.M.

14:15 **Identifying Agronomic Practices that Conserve and Enhance Natural Enemies of Root Maggots (*Delia* spp.) (Diptera: Anthomyiidae) in Canola**

Subramaniam, R., Doslall, L.M., O’Donovan, J.T., and Harker, K.N.

14:30 **Host plant glucosinolate profiles and the cabbage seedpod weevil**

Tansey, J.A., Doslall, L.M., and Keddle, B.A.

14:45 **The influence of canola nutrition on the oviposition choice and larval development of the cabbage seedpod weevil**

Blake, A. J., Doslall, L.M., and Keddle, B.A.

15:00 **COFFEE AND POSTER VIEWING**

### **CONTRIBUTED ORAL PAPERS SESSION 2**

Moderator – Emily Barnewall

15:30 **The foraging activity of the leaf cutter ant, *Acromyrmex echinator*, in dry tropical forest patches in Guanacaste, Costa Rica**

Larson, D.G. and Drozdak, R.

- 15:45 **Mountain pine beetle phenology, survival, and condition in whitebark pine**  
Esch, E.D., Spence, J.R., and Langor, D.
- 16:00 **Patterns of ichneumonid (Insecta: Hymenoptera) diversity in a boreal forest ecosystem**  
Schwarzfeld, M., and Sperling, F.
- 16:15 **Beetle species of fallen trembling aspen deadwood**  
Wood, C. M., Spence, J.R., and Langor, D.W.
- 16:30 **Influence of various retention patches on saproxylic beetles in white spruce stands**  
Lee, S.-I., Langor, D.W., and Spence, J.R.
- 16:45 **From Eggs to Riches: The Use of Hen Egg White Lysozyme to Control Chalkbrood Disease in Honey Bee Colonies**  
Van Haga, A., Keddie, B.A., and Pernal, S.F.
- 18:30 **BANQUET** (Cafeteria, Alumni Hall)  
Cocktails at 18:30  
Dinner at 19:00  
Awards Presentations (Rose De Clerck-Floate, Chair, Awards Committee):  
Student Travel Grants, Undergraduate Award in Entomology, F.S. Carr Award  
Guest Speakers: Josie Van Lent, Associate Dean, Lakeland College and Lester Parsons
- 

## Saturday, November 7

### CONTRIBUTED ORAL PAPERS SESSION 3

Moderator – Meghan Vankosky

- 08:30 **Seasonal Activity of Rocky Mountain Wood Ticks, *Dermacentor andersoni*, in Southern Alberta**  
Lysyk, T.J. and Rochon, K.
- 08:45 ***Ixodes scapularis* and *I. pacificus* ticks in Alberta**  
Sperling, J., Shpeley, D., Leo, S., Jenkins, M., and Sperling, F.
- 09:00 **The Continuing Saga of Introduced Spiders to Alberta**  
Leech, R.E.
- 09:15 **Quarantine assessment of *Rhinusa pilosa* as a potential biological control agent for *Linaria vulgaris***  
Barnewall, E.C. and De Clerck-Floate, R.A.



- 09:30 **Halos, Ripples, and Ghosts of Dispersal Past**  
Van Hezewijk, B.H. and Bouchier, R.S.
- 09:45 **Quantifying Gestalt: Towards an Interactive Matrix-based Key to Canadian Lepidopteran Subfamilies**  
Dombroskie, J. J.
- 10:00 **ENTOMOLOGICAL SOCIETY OF ALBERTA  
ANNUAL GENERAL MEETING**

## Oral Presentation Abstracts

(Alphabetical by presenting author)

### 1. Semiochemical-based mass trapping of the apple clearwing moth (Lepidoptera: Sesiidae)

**Aurelian, V.M.<sup>1</sup>, Evenden, M.L.<sup>1</sup>, and Judd, G.J.R.<sup>2</sup>**

<sup>1</sup>Department of Biological Sciences, CW405 Biological Sciences Bldg, University of Alberta, Edmonton, AB;

<sup>2</sup>Agriculture and Agri-food Canada, Pacific Agri-food Research Centre, Summerland, BC

Infestations of apple clearwing moth, *Synanthedon myopaeformis*, a European pest of apples, were recently discovered in several areas of Canada. Cambium-feeding larvae girdle bark at the rootstock-scion union, which weakens dwarfing apple trees and reduces their yields. Absence of natural enemies and effective pesticides has resulted in extremely high populations, especially in organic apples in southern B.C. Our goal is to develop a semiochemical-based mass-trapping program targeting male and female moths. In this study we compare pheromone- and kairomone-based mass trapping at three different trap densities relative to untreated control plots. In kairomone-baited traps, we use commercial grape juice, known to be highly attractive to both sexes. Mass trapping with grape juice removed large numbers of both males and females. Interference among pheromone traps occurred at very high trap densities (100 traps/ha under high moth densities and 50 traps/ha under lower moth densities). In contrast, no trap interference was detected with juice-baited traps. A combination of male confusion by ambient levels of pheromone and removal from the population through capture in traps may operate in pheromone-based mass-trapping plots. The mechanisms behind the significant decrease in the number of females captured in assessment traps in control plots versus pheromone baited mass trapping plots remain unknown. We predict that high-capacity traps baited with kairomones that target both sexes may be a good alternative to pesticides for decreasing moth densities in organic orchards.

### 2. Quarantine assessment of *Rhinusa pilosa* as a potential biological control agent for *Linaria vulgaris*

**Barnewall, E.C.<sup>1,2</sup>, and De Clerck-Floate, R.A.<sup>1</sup>**

<sup>1</sup> University of Lethbridge, Lethbridge, AB;

<sup>2</sup> Lethbridge Research Centre, Agriculture and Agri-food Canada, Lethbridge, AB

Yellow toadflax, *Linaria vulgaris*, is a non-native, invasive plant of agricultural and natural areas in Canada. Multiple introductions of this plant to North America are suspected, hence, any insects used for biocontrol of *L. vulgaris* will be encountering multiple host genotypes upon release. A pre-release impact assessment of a European weevil, *Rhinusa pilosa*, was conducted in quarantine using Canada-wide *L. vulgaris* populations to help determine the potential efficacy of this candidate biocontrol agent. Impacts were examined by comparing intra- and inter-population plant responses to weevil gall induction and development. Impacts were determined by assessing stem height and growth rate, flower production, and above and below ground biomass. Preliminary analyses show that galled stems were 21% smaller and produced 68% fewer flowers than control stems ( $F_{2,39} = 3.54$ ,  $p = 0.039$ ;  $F_{2,39} = 7.10$ ,  $p < 0.01$ , respectively).

However, above ground biomass was 24% higher in galled plants than in control plants but this difference was not significant ( $F_{1,21} = 1.14$ ,  $p = 0.30$ ). The results from this study will help determine the suitability of *R. pilosa* to different populations (and potentially different genotypes) of yellow toadflax and select non-targets and the impact of any attack. This experiment will contribute valuable information to assist an evaluation of the suitability of *R. pilosa* for release.

### **3. The influence of canola nutrition on the oviposition choice and larval development of the cabbage seedpod weevil**

**Blake, A. J.<sup>1</sup>, Dosdall, L. M.<sup>2</sup>, and Keddie B. A.<sup>1</sup>**

<sup>1</sup>Department of Biological Sciences, University of Alberta, Edmonton, AB;

<sup>2</sup>Department of Agricultural Food and Nutritional Science, University of Alberta, Edmonton, AB

The cabbage seedpod weevil, *Ceutorhynchus obstrictus* (Marsham) (Coleoptera: Curculionidae), is a serious introduced pest of canola, *Brassica napus* L. In an effort to better understand the relationship between host plant nutrition and *C. obstrictus* preferences and its larval developmental biology, we exposed gravid females to host plants grown under differing regimes of nitrogen and sulfur. Results from pod choice arena experiments indicate that plants grown with a higher supply of sulfur were preferred as hosts but only in plants that were grown in at a low nitrogen level. In contrast, larval development experiments show higher development times with increasing nitrogen levels. This increase in development time was not associated with a similar increase in larval weight. These changes in larval development time may or may not represent a significant fitness cost for larval and adult *C. obstrictus*.

### **4. Biodiversity in Agroecosystems: New Developments and Research Needs**

**Cárcamo, H.A.<sup>1</sup> and Olfert, O.<sup>2</sup>**

<sup>1</sup>AAFC, 403 – 1 Ave S. Lethbridge AB T1J 4B1; <sup>2</sup>AAFC, 106 Science Place, Saskatoon SK S7N 0X2

Biodiversity studies attempt to quantify the number of species in a given assemblage and their relative dominance at a defined spatiotemporal scale. In cultivated or grazed ecosystems of the Canadian prairies, few such studies have been conducted and most have focused on carabid beetles. A cursory literature search using the terms “Carabidae” and the name of the prairie province in Agricola, supplemented by our own records, revealed 9 studies of carabids in relation to agricultural practice in Alberta. Four studies include sites from the short and mixed moist grasslands and the rest were conducted in the Parkland eco-region; the vast agricultural Peace River region in the Boreal Plains has not been studied. Spiders, and staphylinid beetles, despite their co-occurrence with carabids in pitfall catches have not received the same attention. For example, no studies of spider diversity were found for agroecosystems in Alberta but two were done in Saskatchewan. We could not find biodiversity studies of these taxa from cultivated fields in Manitoba. Also there are no direct comparisons of cultivated fields and nearby grasslands reserves. Future challenges include filling these geographic gaps and include other key guilds such as herbivores, soil arthropods, foliage dwelling predators, parasitoids and pollinators. Yet a larger challenge is to tackle the functional studies to elucidate the linkages between biodiversity and ecosystem function. This information is needed to answer the perennial questions farmers and policy makers ask: what are the environmental and economic implications of biodiversity and how do we protect it?

## 5. Quantifying Gestalt: Towards an Interactive Matrix-based Key to Canadian Lepidopteran Subfamilies

Dombroskie, J. J.<sup>1</sup>

<sup>1</sup>Dept. of Biological Sciences, CW405, Bio. Sci. Bldg., University of Alberta, Edmonton, AB, T6G 2E9

Identifying Lepidoptera to subfamily or tribe using dichotomous keys is difficult as existing keys cover only distinctive families or rely on difficult characters. A matrix-based key shows great promise as a way to identify Lepidoptera to family because non-discrete characters can be used. I constructed a key using 73 external characters (266 states) that are visible with a dissecting microscope, examined from 1454 specimens in 221 taxon groups. This key will likely become a valuable tool in lepidopteran identifications.

## 6. Invasions of Insects in Agroecosystems in the Western Canadian Prairies: Case Histories and Patterns

Dosdall, L.M.<sup>1</sup>, Cárcamo, H.A.<sup>2</sup>, Olfert, O.<sup>3</sup>, Meers, S.<sup>4</sup>, Hartley, S.<sup>5</sup>, and Gavloski, J.<sup>6</sup>

<sup>1</sup>Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB;

<sup>2</sup>Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB;

<sup>3</sup>Agriculture and Agri-Food Canada, Saskatoon Research Centre, Saskatoon, SK;

<sup>4</sup>Alberta Agriculture and Rural Development, Crop Diversification Centre South, Brooks, AB;

<sup>5</sup>Saskatchewan Agriculture and Food, 3085 Albert Street, Regina, SK;

<sup>6</sup>Manitoba Agriculture, Food and Rural Initiatives, Carman, MB

The Northern Great Plains of North America has been invaded by alien insect species that have caused extensive economic damage to agricultural production. In the last 25 years, invasions of Russian wheat aphid (*Diuraphis noxia* (Mordvilko)), cabbage seedpod weevil (*Ceutorhynchus obstrictus* (Marsham)), pea leaf weevil (*Sitona lineatus* L.), diamondback moth (*Plutella xylostella* (L.)), and cereal leaf beetle (*Oulema melanopus* L.) have occurred, and most have established. Most invading species are believed to have originated from source populations to the south, but orange wheat blossom midge (*Sitodiplosis mosellana* (Géhin)) and swede midge (*Contarinia nasturtii* (Keiffer)) apparently invaded from eastern North America. Biological and chemical control comprise key management strategies for invasive insect pests in agroecosystems. Invasions have affected ecosystem functioning by providing vast resources of herbivorous insects that have been exploited by some predators and parasitoids through expanding their normal host ranges. Further effects on ecosystem functioning resulted from negative impacts of insecticide sprays on indigenous and beneficial species.

## 7. Mountain pine beetle phenology, survival, and condition in whitebark pine

Esch, E.D.<sup>1</sup>, Spence, J.R.<sup>1</sup>, and Langor, D.<sup>2</sup>

<sup>1</sup>Department of Renewable Resources, University of Alberta, Edmonton, AB;

<sup>2</sup>Canadian Forest Service, Northern Forestry Center, Edmonton, AB

Whitebark pine (*Pinus albicaulis*), an endangered keystone of Western North America's sub-alpine forests is threatened by an invasive pathogen, *Cronartium ribicola*, and a native pest, the mountain pine beetle (MPB), *Dendroctonus ponderosae*. MPB phenology, survival, and condition are little known for this host, especially at the northern extent of the tree's range (West Central Alberta). Field experiments at the northern limit of the tree's range show MPB development and

survival are inferior in whitebark compared to lodgepole pine, the MPB's primary host. Despite this, MPBs were capable of completing their development in one year, even at high elevations. Differences in survival and development could not be related to the host's phloem thickness or susceptibility to the blue stain fungi. Laboratory experiments on beetle condition indicate relationships between tree diameter and beetle condition differ between whitebark and lodgepole pine. These results suggest verbanone protection may be the most effective means of controlling MPB population in sub-alpine forests containing whitebark pine.

## **8. Pheromone-based management of agricultural pests: current research and future needs**

**Evenden, M.L.<sup>1</sup>, Gries, R.<sup>2</sup>, Aurelian, M.<sup>1</sup>, Dosdall, L.M.<sup>3</sup>, Judd, G.<sup>4</sup>, Miluch, C.<sup>3,5</sup>, and Wins-Purdy, A.<sup>6</sup>**

<sup>1</sup>Department of Biological Sciences, CW405 Biological Sciences Bldg, University of Alberta, Edmonton, AB;

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<sup>3</sup>Department of Agriculture Food and Nutritional Sciences, 4-16B Agriculture/Forestry Centre, University of Alberta, Edmonton, AB;

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The reliance of moths on sex pheromones for mate finding makes their chemical communication system an ideal target for integrated pest management. Research in my laboratory focuses on the ecology of chemically-mediated interactions of insects (primarily moths) considered to be pests of agricultural, horticultural, and forestry systems and how these interactions might be exploited in pest management. This type of work is highly collaborative and involves basic discovery of chemical signalling systems and their application to monitoring and control of pest populations. The emphasis of this research is on understanding the mechanisms by which moth behaviour is affected by pheromone-based management strategies. Examples of the use of synthetic pheromone for monitoring and control of agricultural pest populations through attract and kill, mass trapping and mating disruption will be presented. Recommended future research directions will be discussed.

## **9. The foraging activity of the leaf cutter ant, *Acromyrmex echinator*, in dry tropical forest patches in Guanacaste, Costa Rica**

**Larson, D.G.<sup>1</sup> and Drozdiak, R.<sup>1</sup>**

<sup>1</sup>Augustana Campus, University of Alberta, 4901 - 46 Ave, Camrose, AB

The foraging activity and efficiency of the fungus rearing *Acromyrmex* leaf cutter ants, a readily recognized insect herbivore in the dry tropical forest patches of the Rio Tempesque watershed in Guanacaste, Costa Rica, was the focus of one of the Augustana undergraduate studies carried out in the February 2009 Tropical Field Course. The pattern of the daily foraging activity period, the rate of travel of laden and unladen ants, the size and types of botanical loads being carried back to the fungal gardens, length of major foraging trails, estimates of daily harvest mass and estimates of colony size were determined for small, medium and large *A. echinator* nests.

## 10. Influence of various retention patches on saproxylic beetles in white spruce stands

Lee, S.-I.<sup>1</sup>, Langor, D.W.<sup>2</sup>, and Spence, J.R.<sup>1</sup>.

<sup>1</sup>Department of Renewable Resources, University of Alberta, Edmonton, AB;

<sup>2</sup>Natural Resources Canada, Canadian Forest Service, Northern Forestry Centre, Edmonton, AB

Sustainable forest management requires intimate knowledge of how forest biota responds to forestry practices. Saproxylic beetles (i.e. beetles that depend on dead or dying wood during some part of their lifecycle) are a diverse group of organisms that provide essential ecosystem functions. Green tree retention has been proposed as a way of conserving biodiversity because retention patches can act as 'life boats', providing source populations for re-colonization of harvested landscapes. To understand the effect of harvest intensity and retention patch size on saproxylic beetle assemblages in boreal white spruce stands, we investigated saproxylic beetles using window and emergence traps among two sizes of clumped retention patches (0.20 and 0.46 ha) within different harvest intensity at the EMEND (Ecosystem Management Emulating Natural Disturbance) landscape.

## 11. The Continuing Saga of Introduced Spiders to Alberta

Leech, R.E.<sup>1,2</sup>

<sup>1</sup> 10534-139 St NW, Edmonton, AB;

<sup>2</sup>Research Associate, Royal Alberta Museum, 12845-102 Ave NW, Edmonton AB

Since the early 70s, 16 species in 11 families have been, or are being, recorded in this paper as introduced to Alberta. These introductions include species that do exist naturally in Alberta, and also individuals of species that do not exist naturally in Alberta. These spider species have been brought in unintentionally by commerce (equipment, crushed rock, fruit and vegetables) and even in packed clothing by unsuspecting holidayers from the U.S.A. and other Canadian provinces. Not considered here are tarantula and other spider species brought in for pet shops and museums. To date, there have not been formal records kept of spider species introduced to Alberta. The following spider families and species of spiders have been introduced to Alberta, and this paper constitutes the first formal record for several of the families and species:

AGELENIDAE: ?*Hololena* sp.? imm., *Tegenaria agrestis* (Walckenaer, 1802), *Tegenaria domestica* (Clerck, 1758), *Tegenaria duellica* Simon, 1875; AMPHINECTIDAE: *Metaltella simoni* (Keyserling, 1878); CTENIDAE: *Cupiennius salei* (Keyserling, 1877), *Cupiennius coccineus* F.O. Picard-Cambridge, 1901; MITURGIDAE: *Cheiracanthium inclusum* (Hentz, 1847); PHOLCIDAE: *Pholcus phalangioides* (Fuesslin, 1775); SALTICIDAE: *Salticus scenicus* (Clerck, 1757); SICARIIDAE: *Loxosceles blanda* Gertsch & Ennik, 1983; SPARASSIDAE: *Heteropoda venatoria* (Linnaeus, 1767); THERIDIIDAE: *Latrodectus hesperus* Chamberlin & Ivie, 1935, *Latrodectus mactans* (Fabricius, 1775); THERAPHOSIDAE: several unidentified genera on fruits from Central and South America.

## 12. Studies on European insects as potential biological control agents for common tansy (*Tanacetum vulgare*) in Canada and the United States

**McClay, A.S.<sup>1</sup>, Gassmann, A.<sup>2</sup> and Wolf, V.C.<sup>2,3</sup>**

<sup>1</sup>McClay Ecoscience, 15 Greenbriar Crescent, Sherwood Park, AB;

<sup>2</sup>CABI-Europe Switzerland Station, rue des Grillons 1, CH-2800 Delémont, Switzerland;

<sup>3</sup> University of Bielefeld, Universitätsstrasse 25, 33615 Bielefeld, Germany

Common tansy (*Tanacetum vulgare* L., Asteraceae) is an invasive herbaceous perennial native to Europe, and was introduced into North America as a culinary and medicinal herb. Now widely naturalized in pastures, roadsides, waste places, and riparian areas across Canada and the northern USA, tansy is also spreading in forested areas. It contains several compounds toxic to humans and livestock if consumed, particularly  $\alpha$ -thujone. Tansy is listed as a noxious weed in several states and provinces. Common tansy is a good target for biological control, as it is a perennial plant growing in stable habitats, and has few native North American congeners. A biological control program for common tansy started in 2006, funded and coordinated by a Canadian-US consortium led by the Alberta Invasive Plant Council and the Minnesota Department of Agriculture. CABI Switzerland Centre is identifying and testing potential agents for efficacy and host specificity. Potential agents under study include a stem-mining weevil *Microplontus millefolii*, a leaf-feeding beetle *Cassida stigmatica*, a flower- and stem-mining moth *Isophrictis striatella*, a stem-boring cerambycid beetle *Phytoecia nigricornis*, and a root-feeding flea beetle *Longitarsus noricus*. Studies are in progress to understand the effects of chemical diversity in the essential oils of *T. vulgare* on host selection by insects.

## 13. Development of a pheromone-based monitoring tool for the red clover casebearer (*Coleophora deauratella*) in Alberta

**Mori, B.A.<sup>1</sup>, Gries, G.<sup>2</sup>, Otani, J.<sup>3</sup>, Yoder, C.<sup>4</sup> and Evenden, M.L.<sup>1</sup>**

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The red clover casebearer (RCC), *Coleophora deauratella*, (Lepidoptera: Coleophoridae) is an introduced pest in the Peace River Region of Alberta. Infestations of RCC in clover can cause up to 99.5% seed loss. Components of the female sex pheromone were identified as (Z)-7-dodecenyl acetate and (Z)-5-dodecenyl acetate, both of which are necessary to attract male RCC. Here we further develop this pheromone-based tool to determine the most attractive dose of the pheromone blend to male RCC, and the trap type with the greatest efficacy for RCC capture. This will produce an optimized monitoring system which can be incorporated into an integrated pest management program to monitor this pest throughout the Prairie Provinces.

#### **14. Climate change effects on rangeland soil microarthropods**

**Newton, J.S.<sup>1</sup>, and Proctor, H.C.<sup>1</sup>**

<sup>1</sup>Department of Biological Sciences, University of Alberta, Edmonton, AB

Canada contains 22,000,000 ha of land dedicated to range and forage production. To mitigate potential impacts of climate change on biodiversity and sustainable production of Canada's rangelands, it is essential to gain an understanding of links between temperature, precipitation, grazing and their effects on soil chemistry and biota. We have conducted a three year study at the Kinsella Research Ranch. Using a factorial design we tested effects of warming, two different precipitation and two defoliation regimes on carbon and nitrogen cycling, forage quality, plant assemblages, soil microbial activity and soil microarthropod assemblages. The data presented are from the first (2007) and third (2009) years of the project. To date, 69 arthropod taxa have been identified, most of them mites (Arachnida: Acari). This includes 8 orders of macro-invertebrates, 3 families of Collembola, 2 families of Astigmata, 2 families of Endeostigmata, 15 families of Prostigmata (including 4 families of Heterostigmata) and 16 families of Oribatida (consisting of 25 genus- or species-level taxa). The microarthropod assemblage was numerically dominated by Collembola and mites (Acari), the latter mainly consisting of prostigmatid mites. The effects of treatments have been validated, but preliminary results suggest that only lowered precipitation significantly affects microarthropod numbers. 2007 results show that mites of the family Tydeidae along with juvenile Oribatida are positively associated with drought. I will also discuss the extraction methods used in this study, by comparing results between the rarely used kerosene floatation method and the more conventional Tullgren extractions.

#### **15. Seasonal Activity of Rocky Mountain Wood Ticks, *Dermacentor andersoni*, in Southern Alberta**

**Lysyk, T.J.<sup>1</sup>, and Rochon, K.<sup>1</sup>**

<sup>1</sup>Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB

Tick populations were sampled at various locations in southern Alberta over a three-year period. The same transects were sampled by dragging weekly from early spring until mid- to late summer when no further tick activity was detected. Tick activity peaked in early spring, immediately following loss of snow cover, and declined thereafter. This surprising result gives new insight on Rocky Mountain Wood Tick population dynamics.

#### **16. Patterns of ichneumonid (Insecta: Hymenoptera) diversity in a boreal forest ecosystem**

**Schwarzfeld, M.<sup>1</sup>, and Sperling, F.<sup>1</sup>**

<sup>1</sup>CW405, Biological Sciences Centre, University of Alberta, Edmonton, AB

Ichneumonidae, the largest family of Hymenoptera, are parasitoids of other arthropods, particularly among the Lepidoptera and Symphyta. As such, they play an important role in forest ecosystems, including limiting populations of potential pest species. However because of their specialized life histories, they may also be particularly vulnerable to ecological disturbances. To determine baseline Ichneumonidae community data for Alberta's boreal forest, I used Malaise traps in various habitats during 2007. In 2008, I collected ichneumonids from four treatments (uncut, 50% retention, 20% retention, clearcut) in deciduous-dominated stands to assess the impact of variable retention harvesting on the ichneumonid community.



This work was performed at the EMEND (Ecosystem Management Emulating Natural Disturbance) site, approximately 90 km northwest of Peace River, AB. Twenty-four subfamilies have been collected, with over 70% of specimens belonging to the four most abundant subfamilies. One subfamily, the Pimplinae, has been further identified to species, with at least 46 species in 22 genera present. I will discuss the seasonal, geographical and habitat patterns of Alberta's boreal ichneumonid community.

### **17. *Ixodes scapularis* and *I. pacificus* ticks in Alberta**

**Sperling, J.<sup>1</sup>, Shpeley, D.<sup>1</sup>, Leo, S.<sup>1,2</sup>, Jenkins, M.<sup>2</sup>, and Sperling, F.<sup>1</sup>**

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<sup>2</sup> City of Edmonton Environmental Services, Edmonton, AB

Recent reports have documented the distribution of *Ixodes scapularis* and *I. pacificus* throughout southern Canada - except for Alberta. As these two tick species are recognized as the primary vectors for Lyme disease, this gap implies a low risk of Lyme disease for Alberta. However, over the last decades in the Edmonton area we have received for identification a number of ticks of these two species. Although the recent travel history of the human and other hosts of these ticks is incompletely documented, it is important to note that the putative vectors of Lyme disease have been consistently present in central Alberta.

### **18. Identifying Agronomic Practices that Conserve and Enhance Natural Enemies of Root Maggots (*Delia* spp.) (Diptera: Anthomyiidae) in Canola**

**Subramaniam, R.<sup>1</sup>, Dossdall, L. M.<sup>1</sup>, O'Donovan, J.T.<sup>2</sup>, and Harker, K.N.<sup>2</sup>**

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Root maggots (*Delia* spp.) (Diptera: Anthomyiidae) are serious pests of canola in western Canada. Studies were undertaken in central Alberta to identify agronomic practices that can affect the survival and abundance of *Aleochara bilineata* (Coleoptera: Staphylinidae), which is an important natural enemy of root maggots. Adults of *A. bilineata* feed on eggs and larvae of root maggots, and *A. bilineata* larvae parasitize *Delia* spp. puparia. Although *A. bilineata* occurs commonly in canola in western Canada, we have no knowledge of strategies that can enhance its effectiveness as a predator and parasitoid. Our research aims to enable farmers to increase populations of this beneficial insect by modifying current production practices without incurring major input costs. Our study involved manipulation of tillage regime (conventional versus zero tillage), row spacing, and seeding rate, to assess effects on *A. bilineata* populations. We observed greater root maggot damage to plants grown in conventional tillage than in zero tillage, and increases in plant density generally resulted in a decline in root maggot damage to canola taproots. Activity density of *A. bilineata* was greater in plots tilled conventionally than in zero-till plots. Parasitism was generally greater in zero-till plots than in plots tilled conventionally; however, no consistent effects were observed on *A. bilineata* parasitism in relation to seeding rate and row spacing. The appropriate combination of agronomic practices that enhance *A. bilineata* populations has yet to be identified through our ongoing further research involving an additional site-year of data.

## **19. Host plant glucosinolate profiles and the cabbage seedpod weevil**

**Tansey, J.A.<sup>1</sup>, Dosedall, L.M.<sup>1</sup>, and Keddie, B.A.<sup>2</sup>**

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<sup>2</sup>Department of Biological Sciences, CW 405 Biological Sciences Centre, University of Alberta, Edmonton, AB

Compounds associated with Brassicaceae have electrophysiological and behavioural effects on the cabbage seedpod weevil, *Ceutorhynchus obstrictus* (Marsham) (syn. *C. assimilis* (Paykull)) (Coleoptera: Curculionidae). These substances include glucosinolates and their hydrolysis products. We present results of a laboratory olfactometer study examining the attractiveness of odours from resistant and susceptible novel germplasm developed from *S. alba* x *B. napus* and the parental genotypes, *B. napus* and *S. alba*. We also examined adult weevil feeding and oviposition preferences for and larval development times and weights associated with resistant and susceptible germplasm. These results and comparison with previous chemical analyses of these genotypes suggest the attractive effects of 2-phenylethyl glucosinolate and potential antifeedant or toxic effects of 1-methoxy-3-indolylmethyl glucosinolate.

## **20. The effects of soil nitrogen, *Rhizobium* inoculation and insecticide seed coatings on yield loss and nitrogen fixation in field peas under *Sitona lineatus* attack**

**Vankosky, M.A.<sup>1,2</sup>, Cárcamo, H.A.<sup>2</sup>, and Dosedall, L.M.<sup>1</sup>**

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<sup>2</sup> Agriculture and Agri-Food Canada, Lethbridge Research Centre, 5403 - 1 Avenue South, Lethbridge, AB

The pea leaf weevil (*Sitona lineatus* L., Coleoptera: Curculionidae) is an exotic pest of field pea (*Pisum sativum* L., Fabales: Fabaceae) in southern Alberta. Yield loss results from adult feeding on plant foliage and larval feeding on root nodules, which reduces the protein content of seeds and the amount of nitrogen returned to the soil due to consumption of *Rhizobium leguminosarum* bacteria. In 2008 and 2009, we investigated the impacts of soil nitrogen (N), *Rhizobium leguminosarum* inoculation (INOC) and insecticide seed coating (CRUISER), in various combinations, on *S. lineatus* herbivory and pea yield at Lethbridge and Vauxhall. In 2008, above and belowground damage differed among treatments at Vauxhall, with no differences in yield. Foliar damage, determined by counting leaf notches, was significantly lower on CRUISER plots than on plots with no insecticide application. At Lethbridge, only yield and pea protein differed among treatments, with the greatest yield occurring on plots treated with INOC+N, followed by CRUISER+INOC+N and INOC. Protein content was greatest on plots treated with CRUISER+INOC+N, followed by INOC+N and INOC. In 2009, preliminary results show that foliar damage varied among treatments at Vauxhall and Lethbridge. CRUISER plots generally had less foliar damage and plots with N or INOC+N had more foliar damage. Our results suggest that yield will be protected when peas are grown in soil with recommended nutrient levels and sufficient *Rhizobium* populations. Incorporating an insecticidal product, such as Cruiser, in an integrated pest management program for *S. lineatus* will also protect yield.

## **21. From Eggs to Riches: The Use of Hen Egg White Lysozyme to Control Chalkbrood Disease in Honey Bee Colonies**

**Van Haga, A.<sup>1,2</sup>, Keddie, B.A.<sup>2</sup>, and Pernal, S.F.<sup>1</sup>**

<sup>1</sup>Agriculture and Agri-food Canada, Beaverlodge Research Farm, Beaverlodge, AB;

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Chalkbrood, caused by *Ascosphaera apis* (Maassen ex Claussen) Spiltoir and Olive (1955), is a cosmopolitan fungal disease of honey bee larvae (*Apis mellifera* L.) for which there is no registered chemotherapeutic control. Previously, it was determined that lysozyme-HCl, a broad spectrum antimicrobial extracted from hen egg albumen, was effective at controlling chalkbrood *in vitro*. A field trial was conducted in which 40 artificially-infected package colonies were inoculated with pollen containing homogenized black and white chalkbrood mummies and administered three treatments of 600, 3000, or 6000 mg lysozyme-HCl in 50% (w/v) sucrose syrup. Colonies were evaluated for disease severity, brood and adult bee populations and honey production over spring and summer months. Lysozyme-HCl did not affect adult bee survival or brood production and did effectively suppress the development of chalkbrood disease. Daily chalkbrood mummy production decreased by a factor of 10 in colonies treated with three applications of 6000 mg of lysozyme-HCl when compared with infected, untreated controls and reduced disease symptoms to levels observed in uninfected colonies. Honey production was significantly negatively correlated with increased disease severity. Lysozyme-HCl shows promise as a new, food-grade therapy for the control of chalkbrood disease in honey bee colonies.

## **22. Halos, Ripples, and Ghosts of Dispersal Past**

**Van Hezewijk, B.H.<sup>1</sup> and Bourchier, R.S.<sup>1</sup>**

<sup>1</sup>Agriculture & Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB

It has been previously observed that in the years following a point release, the weed biocontrol insect, *Apthona lacertosa*, can have an approximately circular region of impact on its host plant leafy spurge. In subsequent years, adult beetles are highly aggregated on healthy plants at the edge of this expanding 'halo' of dead plants. We hypothesized that the cause of this spatial pattern resulted from one of two processes: outward dispersal of adults with arrestment behaviour at the edge of the halo, or, higher rates of reproduction and emergence at the edge of the halo. Using a grid of 140 emergence traps to monitor the spatio-temporal patterns of emergence, and weekly sweep-net samples to monitor adult distributions, we discovered an unexpected pattern. Adult beetles did diffuse outward from an emergence area, but this area was not fixed in space. Over the course of the season, the pattern of beetle emergence resembled a circular wave, travelling outward from a central focus. It is thought that this pattern represents the signature of dispersal and oviposition patterns from the previous year(s) and has important implications for the long-term persistence of these populations.

### **23. Bio-climatic approaches to assess the potential impact of climate change on insect populations in agroecosystems**

**Weiss, R.M.<sup>1</sup> and Olfert, O.<sup>1</sup>**

<sup>1</sup>Agriculture and Agri-Food Canada, Saskatoon Research Centre. 107 Science Place, Saskatoon, SK

The role of climate in determining the geographical distribution of plants, arthropods and pathogens is well documented. There has been considerable concern in recent years about climatic changes caused by human activities and their effects on agriculture. Global warming conditions may impact temperate insect populations by increasing growth and development rates, shortening generation times, extending the growing season, reducing overwintering mortality, altering timing of emergence from overwintering sites, and changing their geographic distribution. Predictive bio-climatic modelling approaches have been used to quantify species – environment interactions, in relation to changes in climate. Once bio-climatic models have been validated and vetted through peer-review, future climate scenarios can be applied either through a) incrementally adjusting climate variables (e.g. +1, +2, +3 °C) in order to study the sensitivity of a specific system's response to a range of potential climatic changes, or b) through application of comprehensive climate scenarios taken from Global Climate Models (GCMs). These two approaches are useful in studying the behaviour or responsiveness of a species to projected climate changes, and the impacts this may have on issues of interest (e.g., agriculture and biodiversity). Case studies of insect pests are used to illustrate the utility of these approaches, and to draw out the general patterns of response.

### **24. Beetle species of fallen trembling aspen deadwood**

**Wood, C. M.<sup>1</sup>, Spence, J.R.<sup>1</sup>, and Langor, D.W.<sup>2</sup>**

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As trees die and decay, they provide heterogeneous habitats which are anything but devoid of life. Deadwood supports a large number and diversity of forest dwelling arthropods, many of which are "saproxylic" (i.e. entirely dependent on dead or dying wood). Although saproxylic arthropods are important in providing crucial ecosystem services (decomposition, nutrient cycling), our knowledge of the fauna and their required habitats is limited. To determine the deadwood-associated beetle species and their habitat requirements in northwestern Alberta, we hand collected and reared beetles from various decay states and sizes of fallen trembling aspen (*Populus tremuloides*) deadwood. The communities of saproxylic beetles in various deadwood habitats will be presented and implications for forest management practices will be discussed. The conservation of our forest dwelling species is critical to maintain ecosystem function, resilience and resistance.

## Poster Presentation Abstracts

(Alphabetically by presenting author)

### **25. A test of containment efficacy using living insects in a release and recapture study**

**De Clerck-Floate, R.<sup>1</sup>, Floate, K.D.<sup>1</sup>, and Saunders, P.<sup>1</sup>**

<sup>1</sup>Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB

North American regulatory standards for the containment of arthropods in quarantine stipulate that such facilities be specially designed to prevent arthropod escapes. They are to be equipped with a vestibule light lock containing a UV or regular light trap, and inner rooms with negative air pressure. To test the efficacy of various containment methods, a release and recapture study was conducted within an operational quarantine using three insect species; *Aphodius distinctus*, *Musca domestica*, *Urolepis rufipes*. The optimum method for escape prevention varied with species. A combination UV/incandescent light trap, a pan/water trap, and negative air pressure are all recommended.

### **26. What happened to the coprophilous insects associated with bison?**

**Floate, K.D.<sup>1</sup>, and Tiberg, K.<sup>2</sup>**

<sup>1</sup>Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB

<sup>2</sup>Department of Biology, The University of Lethbridge, Lethbridge, AB

There is speculation that the virtual eradication of bison (*Bison bison*) from North America may have caused the extinction of coprophilous insect species that bred in bison dung. Alternatively, these insects may now breed in cattle dung. To our knowledge, the suitability of cattle dung as a substitute for bison dung has not been experimentally addressed for dung breeding insects. In Part 1 of a two-part study, we compared captures of coprophilous beetles (Scarabaeidae, Staphylinidae, Histeridae, Hydrophilidae) in pitfall traps baited with: (B) dung of bison fed a diet of mixed natural grass and hay, (C) dung of cattle fed a hay diet with ca. 10% grain, or (CS) dung of cattle fed barley silage. Analyses were performed on nine taxa that comprised 99.2% of the 21 369 beetles recovered. No native or non-native taxa preferred bison dung over that of cattle. Four taxa preferred CS to C dung, and two taxa preferred C to CS dung. These results support the hypothesis that native species of insects originally breeding only in bison dung would have been able to breed in cattle dung once it became available. In Part 2 of this study, we compare the richness and abundance of insect species that completed egg-to-adult development in B, C and CS dung. These latter results are not yet available.

### **27. Introduction of exotic dung beetles into Canada to accelerate degradation of cattle dung**

**Floate, K.D.<sup>1</sup>, and Watson, W.<sup>2</sup>**

<sup>1</sup> Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB

<sup>2</sup> North Carolina State University, Raleigh, NC

Dung-fouled pastures are poorly used by cattle, which avoid feeding on contaminated grasses. The resulting patchy grazing pattern causes economic losses for the industry such that rapid dung degradation is desired. Efforts now are underway in southern Alberta to establish populations of the coprophagous beetles, *Digitonthophagus gazella* and *Onthophagus taurus*

(Coleoptera: Scarabaeidae), which are recognized for efficiently burying dung. Establishment of *O. taurus* is considered likely, given reports of populations within 300 km of the Canada/USA border. Establishment of *D. gazella* is unlikely, but is being studied to test predictions of climatic models under field conditions.

## **28. Prevalence of *Arsenophonus* in leafhopper vectors of phytoplasma**

**Olivier, C.<sup>1</sup>, Galka, B.<sup>1</sup>, and Floate, K.D.<sup>2</sup>**

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Is the ability of leafhoppers to vector plant pathogens (e.g., phytoplasmas) affected by coinfections of symbiotic bacteria? We examined this question in a survey of four leafhopper populations ( $n = 66$  species) collected in vineyards and crops in Canada. Genetic markers identified infections of the species '*Candidatus phytoplasma asteris*' in 15 species and infections of *Arsenophonus* and/or *Wolbachia* bacteria in 40 species. The correlation between infections of symbionts, phytoplasma and leafhopper population location is discussed.

## **29. Diversity Patterns of Spiders in White Spruce Stands**

**Pinzon, J.<sup>1</sup>, Spence, J.R.<sup>1</sup> and Langor, D.<sup>2</sup>**

<sup>1</sup>Invertebrate Ecology Laboratory, Department of Renewable Resources, 442 Earth Sciences Building, University of Alberta, Edmonton, AB

<sup>2</sup>Canadian Forest Service, Northern Forestry Centre, Edmonton, AB

Spiders were collected at the Ecological Management by Emulating Natural Disturbances (EMEND) project landbase, located in the mixedwood boreal forest of NW Alberta. Eight trees within three uncut white spruce stands were selected and spiders collected from 12 height classes. Ground spiders (H0) were collected using pitfall traps; spiders from the shrub layer (H1) were collected by beating on a 1 x 1 m canvas sheet within 5 m radius from selected trees; spiders from the remaining height classes (H2-H11) were collected from tree branches that were accessed using aluminum sectional ladders, branches were cut up to 12 m high and dropped to the ground onto a 20 x 15 feet plastic tarp. Species diversity was calculated for each height class by tree and averaged using Shannon's ( $H'$ ) and Simpson's (1-D) diversity measures. Species turnover, based on pair-wise comparisons between shared, gained and lost species between height classes, was calculated. A cluster analysis, based on Jaccard distance, was carried out to assess vertical patterns in species composition. Diversity showed a clear decreasing pattern from the ground to higher layers. A layering effect was observed in terms of vertical species turnover, revealing three main strata: ground, understory and overstory; thus, spiders in white spruce show a marked vertical stratification in lower layers and a weak pattern within higher layers. These results show the relevance of spider assemblages within a vertical gradient and the importance of preserving structural features in the forest to better maintain spider biodiversity in old-growth forests.

### 30. Parasitoid competition? or Can parasitoids distinguish previously parasitized hosts?

Waller, J.L.<sup>1</sup>

<sup>1</sup>Department of Biological Sciences, University of Alberta, Edmonton, AB

Parasitoids are believed to influence the population dynamics of the forest tent caterpillar (FTC), *Malacosoma disstria* (Lepidoptera: Lasiocampidae). Therefore, I am investigating the FTC parasitoid community in northern Alberta. Over 10,000 FTC larvae and pupae were collected in 2008, from which approximately 3500 parasitoids were reared. The majority of parasitoids were flies, with the two most common being *Arachnidomyia aldrichi* (Parker) (Diptera: Sarcophagidae) and *Carcelia malacosomae* (Sellers) (Diptera: Tachinidae). *C. malacosomae* attacks FTC larvae and emerges from FTC pupae, while *A. aldrichi* attacks FTC in the pupal stage. Interspecific competition was observed and investigated between these two parasitoids. In 2008 fewer FTC than expected were found to contain both *A. aldrichi* and *C. malacosomae* indicating that either one parasitoid was outcompeting the other or *A. aldrichi* was choosing unparasitized FTC hosts. The 2008 data suggests that *A. aldrichi* may not be outcompeting *C. malacosomae* since FTC pupal parasitism by *C. malacosomae* was higher than FTC larval parasitism by *C. malacosomae*, the opposite of what would be expected if *A. aldrichi* was outcompeting *C. malacosomae* inside the host. Field tests conducted in 2009 supported the suggestion that *A. aldrichi* selects unparasitized FTC hosts. This could lead to a better chance of survival for both parasitoid species, resulting in a greater overall rate of FTC parasitism which may have important implications for FTC population dynamics.

### 31. Does *Bracon cephi* reduce stem mining by wheat stem sawfly?

Wu, X.<sup>1,2</sup>, Carcamo, H.<sup>1</sup>, and Beres, B.<sup>1</sup>

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The wheat stem sawfly has been a major pest of spring wheat in the southern prairies of Canada and the adjoining parts of the United States. *Bracon cephi* (Gahan) is an important endemic ectoparasitoid of the wheat stem sawfly that can reach very high levels of parasitism. The objectives of this study were to determine the effect of *B. cephi* on the feeding damage (stem mining) caused by sawfly and consequences on grain wheat yield. The cultivars studied included solid and hollow stem wheat. This study was conducted at Coalhurst, west of Lethbridge in 2003-2005, and 2008. Our results showed that stems not infested by the wheat stem sawfly tended to have lighter grain heads than those infested. There was no consistent difference in grain head weights among the various stem classes that were infested by sawfly. In 2008, the length of the feeding tunnel was significantly shorter in parasitized stems than those cut or with dead sawfly larvae; in other years the differences were not significant. We concluded that although *B. cephi* reduced stem mining by the wheat stem sawfly it did not affect the seed weight in our study. Nevertheless, reduction in stem lodging during the growing season and lower sawfly populations in following years are important reasons to conserve this parasitoid.

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| Subramaniam, R. ....    | 17             |
| Tansey, J.A. ....       | 18             |
| Tiberg, K. ....         | 21             |
| Vankosky, M.A. ....     | 18             |
| Van Haga, A. ....       | 19             |
| Van Hezewijk, B.H. .... | 19             |
| Waller, J.L. ....       | 23             |
| Watson, W. ....         | 21             |
| Weiss, R.M. ....        | 20             |
| Wins-Purdy, A. ....     | 13             |
| Wolf, V.C. ....         | 15             |
| Wood, C.M. ....         | 20             |
| Wu, X. ....             | 23             |
| Yoder, C. ....          | 15             |

# Minutes of the Entomology Society of Alberta Executive/Board of Directors Meeting

Location: Vermilion, November 5, 2009

Meeting called to order at 16:49

Chair: Brian van Hezewijk (President)

**In Attendance:** Rose De Clerk-floate (Past-President), Lloyd Dosedall (Regional Director to ESC), Ken Fry (Secretary), Gerald Hilchie (Northern Director), Fran Leggett (Southern Director), Kimberly Rondeau (Treasurer), Alec McClay (Webmaster) , Greg Pohl (Vice President), Emily Barnewall (Proceedings Editor)

Regrets: Mary Reid (Central Director)

1. Additions to Agenda and approval  
Add 20.1 U. of A. reunion  
Add 9.5 report on proceedings  
Move 12 up to 2.5

**MOVED** by Greg, Seconded by Alec that the agenda be approved; Carried

2. Approval of April 3, 2009 Executive Meeting Minutes

**MOVED** by Fran, Seconded by Rose that the minutes be approved; Carried

2.5 Peter welcomed the executive. Announced sponsorship of \$400.00 by Webb's Crop Services and \$1000.00 by Lakeland College. A news release was prepared and delivered to local media.

3. Report from Northern Director (Gerald Hilchie)
  - Received
  - See attached report
4. Report from Central Director (Ken Fry for Mary Reid)
  - Received
  - See attached report
5. Report from Southern Director (Fran Leggett)
  - Received
  - See attached report
6. Report from Webmaster (Alec McClay)
  - Received
  - See attached report

**MOVED** by Alec, seconded by Fran to change the ESA web host to a private host company and register the domain name, EntSocAlberta.ca for the Society; Carried.

- Orkin offer to link respectfully declined as per direction of ESA executive.
7. Report from Secretary (Ken Fry)
    - Received
    - See attached report
  8. Report from Regional Director to entomological Society of Canada (Lloyd Dossdall)
    - Received
    - See attached report
    - As co-host of national meeting the ESA must draft and send a letter of invitation to the national society.
  9. Report from the Treasurer (Kimberly Rondeau)
    - Received
    - See attached report
  10. Nominations (Greg Pohl)
    - a. President: Greg Pohl
    - b. Vice President: Rob Longair
    - c. Treasurer: Kim Rondeau
    - d. Web Master: Alec McClay
    - e. Proceedings Editor: Emily Barnewall
    - f. Central Director: Mary Reid
    - g. Auditors: TBD
  11. Proceedings (Emily Barnewall)
    - 75 copies printed with a pdf to be posted on the website.
    - Greg will take pictures at the AGM
  12. Awards (Rose De Clerk-Floate)
    - Carr Award to Jan Scott
    - Undergraduate Award to Boyd Mori
    - Travel awards of \$300.00 each to Marius Aurelia, Jaime Pinzon, Boyd Mori, Emily Barnewall and Meghan Vankosky

**MOVED** by Rose, Seconded by Greg, All reports accepted; Carried

Business arising from previous minutes:

13. Long Term Financial Strategy of the Society (Greg Pohl)
  - See attached report

**MOVED** by Rose, seconded by Lloyd that the ESA thank Greg Pohl and the Finance Committee for their hard work in preparing the report on long term financial strategy of the Society and accept the recommendations in the report to serve as guidance for financial stewardship of the society; Carried

14. ESA display promotions poster (Rose De Clerk-Floate)
- Poster prepared and 3 copies to be sent to the regional directors
  - A pdf is to reside on the website
15. Binding of proceedings (Brian van Hezewijk)
- Proceedings binding project is up to date.
  - 8 years have accumulated so far and will wait until 2012 to have a full volume to be bound.
  - Brian expressed thanks to Rose for initiating the effort.
16. Standing Committee on Membership fees (Greg Pohl)
- See attached report
  - Modify call for papers to be more enticing to amateurs
  - Free lifetime membership for all past and future Carr Award winners

**MOVED** by Alec, seconded by Fran that the executive bring to the AGM the recommendation that regular member dues be raised to \$20.00 and student dues be raised to \$10.00; Carried

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#### New Business

17. Internet domain name for the Society (Alec McClay)
- Discussed during webmaster's report
18. Location of next meeting
- South
  - Organizer TBD
19. Finalize Business Meeting agenda
- Agenda finalised
20. Additional Business
- U. of A. reunion (Ken Fry)
    1. 90<sup>th</sup> anniversary of the Department of Entomology at the U. of A. Possibility of having a reunion function in conjunction with the annual meeting
21. Adjournment

**MOVED** by Emily, Adjourn the meeting at 19:27

# Minutes of the Entomological Society of Alberta 56<sup>th</sup> Annual General Meeting

Lakeland College, Vermilion, November 7, 2009

Minutes prepared by Ken Fry, ESA Secretary

## Attendees:

George E. Ball, Kay Ball, Emily Barnewall, Bill Barr, Stephane Bourassa, Bryan Brunet, Hector Carcamo, Rose De Clerck-Floate, Lloyd Dosedall, Jason Dombroskie, Julian Rowe Dupuis, Evan Esch, Kevin Floate, Ken Fry, Gerald Hilchie, Robin Leech, Fran Leggett, Lisa Lumley, Michelle Mark, Alec McClay, Greg Pohl, Enjamin Proshek, Kateryn Rochon, Kimberly Rondeau, Marla Schwarzfeld, Felix Sperling, Brian van Hezewijk, Lorie Taylor, Xiuhua Wu

Meeting called to order at 10:23 am

### 1. Additions to agenda and approval

- item 15 added by Robin Leech: Scholarships for graduate students
- moved to accept as amended, Felix Sperling; seconded, Fran Leggett

### 2. Approval of minutes from the Fall 2008 AGM

- moved to accept, Felix Sperling; seconded, Alec McClay

CARRIED

### 3. Webmaster's Report (Alec McClay)

- see attached report

### 4. Report from Regional Director to Entomological Society of Canada (Lloyd Dosedall)

- see attached report
- moved to accept, Lloyd Dosedall; seconded, Felix Sperling

CARRIED

### 5. Secretary's Report (Ken Fry)

- see attached report

### 6. Treasurer's Report (Kimberly Rondeau)

- see attached report
- moved to accept all reports, Ken Fry; seconded, Robin Leech

### 7. Nominations (Greg Pohl): nominations were presented as follows:

- President – Greg Pohl
- Past President – Brian van Hezewijk
- Vice President – Rob Longair
- Treasurer – Kim Rondeau
- Secretary – Ken Fry
- Central Director – Mary Reid

- g. Auditors – Robin Leech & Marla Schwartzfeld
- h. Proceedings editor – Emily Barnewall
- i. Webmaster – Alec McClay

There were no additional nominations from the floor. Robin Leech moved that nominations cease; seconded by Hector Carcamo. Moved by Greg Pohl; seconded by Rose De Clerck-Floate that officers as presented be accepted.

CARRIED

8. Resolutions: the following resolution was prepared and read by Benjamin Proschek and Evan Esch:

Whereas the 2009 57<sup>th</sup> Annual Meeting of the Entomological Society of Alberta at Lakeland College, Vermilion, Alberta was a smashing success of resounding proportions; whereas a grand, edifying and enlightening experience was had by all, due to pleasant accommodations, engaging presentations, outstanding culinary delights, and warm hospitality of the hosting members; whereas Buggy Jeopardy was fun for some, embarrassing for others, and entertaining for all; and whereas credit is due to the astute planning and execution of plans by 1. Meeting Chair Brian Van Hezewijk; 2. Local Arrangement Committee Peter Walsh & Michael Crowe; 3. Scientific Program Committee Lloyd Dodsall & Alex McClay; 4. Registration and Finance Chair Kim Rondeau; 5. Staff at Lakeland College; and 6. Lester Parsons for his totally righteous and enlightening keynote address: let it be resolved that it was definitely worth the drive.

9. 2010 Meeting to be held in the south, likely Lethbridge. Hector Carcamo: The Canadian Phytopathological Society is hosting a joint meeting with the Western Forum on Pest management in October. Can the ESA investigate the possibility of aligning our 2010 meeting with these two other meetings?

#### **Business arising from previous meetings**

10. Greg Pohl: Alberta Lepidopterist's Guild has joined the Federation of Alberta Naturalists to lobby FAN over insect collecting issues. FAN has adopted a pro-collecting policy.

#### **New business**

11. ESA will be co-hosting the national meeting in 2012. It was noted that 2012 is also the 60<sup>th</sup> anniversary of the ESA and the 90<sup>th</sup> anniversary of the Department of Entomology of the U. of A.

12. Membership Greg Pohl: That membership dues be raised to \$20 per year for regular members, and \$10 per year for students, effective January 1 2010; that the society offer a five-year dues payment option, payable in advance at a 20% discount (not to be applied retroactively to dues in arrears); and that the society award free lifetime regular memberships to all past and future recipients of the Carr Award. Moved to accept, Greg Pohl; seconded by Robin Leech.

CARRIED

13. Facebook Group: Kimberly Rondeau has erected a Facebook group for the ESA. It is to be used as a forum for communication. Privacy settings left open to encourage viewership.

14. ESA Poster: Rose De Clerck-Floate: 3 posters printed advertising the society and are available for loan. A pdf of the poster to be kept on file with the Secretary for distribution. Bookmarks and postcards also available.

15. Scholarships for graduate students. Robin Leech: Suggests that ESA sponsor a scholarship on an annual basis instead of as an endowment. Robin to provide information to the Executive for evaluation.

16. President's Address

Brian van Hezewijk read his presidential address as outgoing ESA President (see attached).

17. Adjournment

- move to adjourn by Robin Leech; seconded, Kevin Floate
- meeting adjourned at 11:16am.

## **2009 Regional Director to the Entomological Society of Canada Report Lloyd Dossall**

Survival of *The Canadian Entomologist* remains a pressing issue of concern to the ESC. Acceptable manuscripts have declined over the years, and in spite of low page charges a significant number of ESC members are publishing their work elsewhere. The rejection rate of manuscripts is approximately at 60%. Robb Bennett, Editor-in-Chief, will resign effective October 2011. Scanning of the back issues of *The Canadian Entomologist* and the *Memoirs* is completed, and will be available to members on-line soon, if not already. In 2008, the ESC had a net surplus of more than \$30K, and the finances of the Society remain sound. Dr. Cedric Gillott will take over from Dr. K. Floate as editor of the *Bulletin* effective on 1 January 2010. The *Bulletin* and the list of insect common names are the items on the ESC website that receive the greatest volume of traffic.

The Joint Annual Meeting of the Entomological Societies of Canada and Manitoba was held recently at the Hotel Fort Garry, Winnipeg, Manitoba from Sunday October 18 to Wednesday October 21, 2009. Symposia included sessions on Apiculture, Host-Symbiont Interactions, Potato Entomology, Pollination, Urban Forestry, and Forest Arthropods. Approximately 250 people registered at the meeting.

Membership in ESC remains a concern, with a loss of ca. 6% (29 memberships) in the past year. Maintaining strong membership numbers will be a main concern for the new Executive and the Membership Committee.

The membership of the ESC has supported a resolution put forward by the ESC Science Policy and Public Education Committee on Access and Benefits Sharing. This issue has arisen as a result of the Convention on Biological Diversity (signed in 1992) which safeguards the genetic resources of countries, especially from agencies that wish to promote the commercial value of those various genetic resources. Unfortunately the Convention ruling has been interpreted to prevent collections of insects in some countries for public good use (e.g., for purposes of systematics or biological control), and some insect collectors in some countries have been given severe fines and even jail terms. The Science Policy Committee opposes restrictions to entomological research that will serve to slow or halt the development of creative new ideas that have potential to be used for the common good.

The ESC was involved with a lawsuit in the past year involving the ProQuest company. ProQuest has provided a microfiche service for the past 20 years, to academic institutions. Some ESC papers were associated with ProQuest. A journalist launched a class action lawsuit against ProQuest because the journalist's work was allegedly released, for profit, by ProQuest without the approval of the journalist. The ESC was one of many groups named in the lawsuit. Although the ESC needed to obtain some legal council, non-profit groups like the ESC were dropped from the lawsuit in September.

Lloyd Dossall, October 2009



## 2009 Northern Director's Report Gerald Hilchie

A New award/grant is being put together to honour John and Bertha Carr, through the Ent. Soc. of Canada. Money for the award is coming from the Carr family.

### Awards and Honours:

Joelle Lemmen, received "The" top GSA (Graduate Students Association) Graduate Teaching Award and a UTS (University Teaching Service) Award for her efforts in teaching lab sections of Entomology 220. Joelle also received an ESC travel Scholarship which was used for attending a chemical ecology course in Sweden.

Lisa Lumley, received a Department of Biological Sciences Teaching Award.

Wes Hunting, received a UTS teaching Award.

Boyd Mori, recently won the President's Prize award for the best student poster at the ESC meeting in Winnipeg.

Adam Blake, received the President's Prize student paper award at the ESC meetings.

### Events:

On March 20, 2009, The Department of Biological Sciences held the 13<sup>th</sup> annual Strickland Memorial Lecture in Entomology featuring Cameron Currie (University of Wisconsin-Madison) who spoke on "Drugs from bugs of bugs: Symbioses between insects and actinobacteria".

### Metamorphosis:

Graham Griffiths, a long time member of the ESA and a world expert on anthomyiid flies, passed away, May 3, 2009 from cancer.

### Students currently enrolled in Entomology:

Maya Eveden: 6 students, 1 PDF

Inka Lusebrink: PDF, chemical ecology of the mountain pine beetle invasion. Co-supervised with Nadir Erbilgin.

Tyler Wist: 3<sup>rd</sup> year, PhD, tritrophic interactions in ash -- *Caloptilia fraxinella*--*Apanteles* system.

Joelle Lemmen: 3<sup>rd</sup> year MSc, regulation of male reproductive diapause in *Caloptilia fraxinella*.

Christine Miluch: 4<sup>th</sup> year MSc, anticipated defense date 2009. Development of a semiochemical-based monitoring system for the diamondback moth *Plutella xylostella* (L.) (Lepidoptera; Plutellidae) in canola. Co-supervised by Lloyd Dossall.

Caroline Whitehouse: 3<sup>rd</sup> year MSc, mating behaviour of *Dioryctria abietivorella*.

Marius Aurelian: 2<sup>nd</sup> year MSc, pheromone-based mass trapping of apple clearwing moth.

Boyd Mori: 1<sup>st</sup> year. Development of a pheromone monitoring system for red clover casebearer (*Coleophora deauratella*).

Jens Roland: 4 students

Kurt Illerbrun: 4<sup>th</sup> year of MSc, effect of herbivory by alpine *Parnassius* butterfly larvae on the spatial dynamics of its host plant, *Sedum lanceolatum* the lance-leaved stonecrop. Kurt holds a QueenElizabeth II Scholarship.

Jennifer Waller: 3<sup>rd</sup> year MSc, dynamics of the parasitoid community of the forest tent caterpillar at the front of a host population 'traveling wave'. Jennifer holds a QueenElizabeth II Scholarship.

Amy Nixon: 2<sup>nd</sup> year MSc, forest structure and the role of Allee effects in preventing the spread of forest tent caterpillar outbreaks. Amy holds an NSERC PGS-M Scholarship and an Alberta Ingenuity Scholarship.

Amanda Doyle: 2<sup>nd</sup> year MSc, role of induced host-plant defense on population dynamics of *Parnassius smintheus* butterflies. Amanda holds an NSERC PGS-M Scholarship.

Heather Proctor: 2 students

Jeffrey Newton: 3<sup>rd</sup> year PhD, effects of climate change and grazing intensity on diversity and food-web structure of rangeland microarthropods. In March Jeffery received an Alberta Conservation Association Biodiversity Grant to look at ant-sternorrhynchan interactions.

Lindsey Wilson: 1<sup>st</sup> year MSc, effects of iron treatment for eutrophication on freshwater invertebrates. She holds an NSERC PGSM award.

Felix Sperling: 8 students, 2 post doc's, 2 BSc student projects.

Julian Dupius: 1st year MSc, speciation and hybridization in swallowtail butterfly species complexes.

Benjamin Proshok: 3<sup>rd</sup> year MSc, population genetics of the endangered Mormon Metalmark butterfly (*Apodemia mormo*) in western Canada and adjacent United States.

Wesley Hunting: defended MSc, phylogenetic analyses, of morphological characters and DNA sequences to understand lineage diversification, geographic variation, species boundaries, and evolutionary pathways of a group of carabid beetles.

Lisa Lumley: 6<sup>th</sup> year, PhD, systematics of the *Choristoneura fumiferana* (Lepidoptera: Tortricidae) spruce budworm species complex.

Maria Djernaes: 5<sup>th</sup> year, PhD, morphology and behaviour of primitive Lepidoptera and Trichoptera. Marie holds an Alberta Ingenuity Fund scholarship, and her work is supported by the Alberta Conservation Association.

Jason J. Dombroskie: 4<sup>th</sup> year PhD, systematics and phylogeography of leaf roller moths (Lepidoptera: Tortricidae) and computerized identification of all Lepidoptera subfamilies across Canada.

Marla Schwarzfeld: 4<sup>th</sup> year PhD, diversity and taxonomy of parasitic ichneumon wasps in Alberta (Hymenoptera: Ichneumonidae), with special reference to *Ophion* species. Marla holds an Alberta Ingenuity Fund scholarship, and a NSERC PGSD award. Her work is supported by the Alberta Conservation Association.

Bryan Brunet: 2<sup>nd</sup> year MSc, genomic architecture of species differences between spruce budworm of the *Choristoneura fumiferana* group in western Canada (Lepidoptera: Tortricidae).

Adrienne Rice: Postdoctoral fellow, identification and characterization of blue-stain fungal assemblages associated with mountain pine beetle.

Patrick James: Killam postdoctoral fellow (cosupervised with David Coltman), modeling of integrated population genomic landscape maps for the mountain pine beetle/ pine/ blue-stain fungal system.

Thomas Simonsen: Accepted position as research scientist at The Natural History Museum, London, UK. Thomas' paper on *Cactoblastis* in *Annals of the ESA* has just won the ESA Editor's Award for that journal.

Sarah Leo: did an undergrad honours project in the Sperling lab during the 2008-9 academic year on *Dermaecentor albipictus*, and received a departmental award for this project.

Winnie Lam, who did an undergrad honours project in the Sperling lab during the 2008-9 academic year on Alberta tick distributions, was awarded a Alberta/Smithsonian Internship this past summer.

Andy Keddie: 6 students

Jennifer Biliske 2<sup>nd</sup> year MSc, investigating role of insulin signalling in *Wolbachia* - insect host interactions.

Philip Batista: 3<sup>rd</sup> year MSc. investigating the association of *Wolbachia* with diamondback moth and one of its parasitoids, *Diadegma* (Hymenoptera, Braconidae).

Adam Blake: 3<sup>rd</sup> year MSc, anticipated defense date 2010. The role of plant quality in the distribution dynamics of the cabbage seedpod weevil *Ceutorhynchus obstrictus* (Marsham). Co-supervised with Lloyd Dossdall. Adam holds a Queen Elizabeth II Scholarship.

Lesley Brennan: 5<sup>th</sup> year PhD, investigating the expression of proteins in a mosquito cell line naturally infected with *Wolbachia*.

Amanda Van Haga: 3<sup>rd</sup> year MSc, investigating chalkbrood in honeybees, determining impacts on bee populations, honey production and a method to reduce the incidence of this disease.

James Tansey: PhD, defended September 2009. Mechanisms of resistance in experimental Canola Germplasm to infestation by the cabbage seedpod weevil, *Ceutorhynchus obstrictus* (Marsham). Co-supervised with Lloyd Dossdall.

Lloyd Dossdall: 6 students

Jeremy Hummel: PhD, defended September 2009. Investigations of wheat and canola intercrops on agronomic performance and dynamics of root maggots and beneficial insects. He has accepted an instructor position at Lethbridge College.

James Tansey: PhD, defended September 2009. Mechanisms of resistance in experimental canola germplasm to infestation by the cabbage seedpod weevil, *Ceutorhynchus obstrictus* (Marsham). Co-supervised with B.A. Keddie. Currently a PDF in Lloyd Dossdall's lab.

Christine Miluch: 4<sup>th</sup> year MSc, anticipated defense date early 2010. Development of a Semiochemical-based monitoring system for the diamondback moth *Plutella xylostella* (L.) (Lepidoptera; Plutellidae) in canola. Co-supervised by M. Evenden.

Ravi Subramaniam: 3<sup>rd</sup> year MSc, anticipated defense date early 2010. Modifying agronomic practices for enhancing natural enemies of root maggots in canola.

Adam Blake: 3<sup>rd</sup> year MSc, anticipated defense date 2010. The role of plant quality in the distribution dynamics of the cabbage seedpod weevil *Ceutorhynchus obstrictus*

(Marsham). Co-supervised with B.A. Keddie. Adam holds a Queen Elizabeth II Scholarship.

Meghan Vankosky: 2<sup>nd</sup> year MSc, anticipated defense date spring 2010. The biology and control of the pea leaf weevil. Co-supervised with H.A. Cárcamo.

John Spence: 9 students

Colin Bergeron: PhD, Boreal forest ecology, biodiversity (Carabidae, trees).

Esther Kamunya: PhD, Insect ecology, biological diversity and conservation (Lepidoptera).

Seung-Il Lee: PhD, 2<sup>nd</sup> year. Saproxylic beetle diversity EMEND (Coleoptera).

Jaime Pinzon: PhD, 5<sup>th</sup> year. Ecology/diversity of spiders (Araneae).

Suzanne Abele: MSc, forest ecology, conservation biology, malacology (Gastropods, Bryophytes).

Matthew Pyper: MSc, boreal forest ecology, biodiversity, sustainable forest management (Carabidae).

Charlene Wood: MSc, 3<sup>rd</sup> year. Forest community ecology (saproxylic insects).

Katarzyna Dyszy: MSc, aquatic biology (aquatic invertebrates, Anura).

Evan Esch: MSc, 2<sup>nd</sup> year. Biodiversity of whitebark pine stands and MPB (Coleoptera and other high-altitude insects).

John Acorn: 1 student

James Glassier: MSc, 1<sup>st</sup> year. Ecology of ants in jackpine sandhill ecosystems. Co-supervised with Scott Neilsen.

## 2009 Central Director's Report

### Mary Reid

#### Research at the University of Calgary

##### **Pollination ecology**

The University of Calgary has an active pollination ecology research cluster consisting of the labs of Ralph Cartar, Lawrence Harder and Jana Vamosi, with another new MSc student in Jeremy Fox's lab contemplating pollination networks. Ralph Cartar and Jana Vamosi are part of the new Canadian Pollination Initiative (CANPOLIN), a NSERC Strategic Research Network announced in September. Within their Ecosystems Working Group (of which Jana is a co-leader), their goals are "1) Assess whether seed set of native and non-native plants (including commercial crops) increases or decreases with increased number or diversity of native or non-native pollinators. 2) Assess whether non-native plants adversely affect the pollination of native or crop plants. and 3) Assess the importance of connectance of pollination webs and generalization and specialization of pollination for the above."

##### **Graduate Students**

###### ***Graduated students***

Danusha Foster, MSc. Causes and consequences of wing wear in foraging bumble bees.

(Supervisor: R. Cartar)

Chris Pengelly, MSc. Effects of variable retention harvest on the bumble bee-dominated pollination community in the boreal forest. (Supervisor: R. Cartar)

Lea Randall, MSc. The Effect of Forest Disturbance on Bats of the Southwest Yukon (includes insect sampling; Supervisors: R. Barclay, M. Reid)

Tyler Reid, MSc. Dispersal studies of mountain pine beetles. (Supervisor: M. Reid)

###### ***New students***

Megan Evans, MSc candidate. Cattle grazing and pollination communities in the rough fescue grassland. (Supervisor R. Cartar)

Chandra Venables, PhD candidate. Molecular phylogeny of (common) predaceous diving beetles in western Canada (Supervisor: S. Vamosi)

###### ***Continuing Students***

Virginia Anne Kowal (M.Sc). Developing terrestrial arthropods as indicators of forest disturbance at the habitat and landscape scales. (Supervisor R. Cartar)

Leanna Lachowsky (MSc) Variation in individual brood and population sex ratios of mountain pine beetles, *Dendroctonus ponderosae*. (transferred to PhD; Supervisor: M. Reid)

Carly Silver (MSc) Macroinvertebrate and waterfowl communities of temporary prairie pothole wetlands. (Supervisor: S. Vamosi)

Bianca Wohlfahrt (PhD) Community structure in predaceous diving beetles. (Supervisor: S. Vamosi)

Tonya Mousseau (Ph.D) Systematics and biogeography of carrion beetles in Southeast Asia (*Nicrophorus: Nepalensis sp. gr.*) (Supervisor: A. Russell)

Lorraine Adderley (MSc). Pollinator diversity in Garry oak ecosystems. (Supervisor: J. Vamosi).

### **Courses at UofC**

- Entomology new Fall 2009 Rob Longair
- Insects, science and society (proposed). Rob Longair
- Tropical Biodiversity and Conservation (in Ghana). May/June 2009. Rob Longair; focus on insect diversity
- Insect Biodiversity, August. Warren Fitch.
- Several independent study students under supervision of Rob Longair, John Swann, Ralph Cartar

### *Other courses involving insect identification and analysis*

- Environmental Science Field Course I. Fall. Mary Reid. Assistance with stream invertebrate sampling from John Swann
- Aquatic Communities and Ecosystems, Fall. Lee Jackson. Lake benthic macroinvertebrates
- Terrestrial Communities and Ecosystems, Winter. Soil macroinvertebrates.

### **Insect Collection**

John Swann is in the midst of organizing the identification and storage of insect samples, and has developed a lab for students to work on insect identification.

### **Community Outreach**

In addition to school talks, Ralph Cartar, Rob Longair and Mary Reid participated in the Bug Jamboree at the Ellis Bird Farm this summer.

## 2009 Southern Director's Report

### Fran Leggett

Dan Johnson is the Canada Research Chair in Sustainable Grassland Ecosystems (2004). He has an opening for a graduate student working on Insect pathology and biological control, for reductions in pesticide use.

Dan has one graduate student, Paul Irvine at this time working on entomological related topics. "Development of improved mathematical models of weather-related spring events, including insect emergence and development." Funded by AAFC Pesticide Risk Reduction Program, Pest Management Centre, Ottawa, and Pulse Canada.

Kevin Floate has one student Graeme Taylor who is jointly supervised with Steve Perlman (U. Victoria, BC)

Tim Lysyk has a postdoctoral fellow Kateryn Rochon working on ticks and Anaplasmosis.

Rose De Clerck-Floate has two Graduate students

1. Emily Barnewall; MSc at the U of L Co-supervised by Cam Goater and Rose  
Topic: investigation of the insect-host plant interactions and efficacy of a stem-galling weevil (*Rhinusa pilosa*) on yellow toadflax (*Linaria vulgaris*), and select non-target plants through histological and biological studies.
2. Haley Catton: PhD at UBC Okanogan, Kelowna, Co-supervised by Bob Lalonde and Rose.  
Topic: the population level interactions of the root weevil *Mogulones cruciger*, on the weed Houndstongue and other members of the borage family.

Hector Caracamo has the following graduate students

1. Meghan Vankosky, MSc student, Dept Agricultural, Food and Nutritional Sciences, U of A, Co-supervised by Lloyd Dodsall and Hector  
Topic: Biology and Management of Pea Leaf Weevil in field peas
2. He also has a Ph.D graduate student from China Ms Xiuhua Wu, Inner Mongolia Agricultural University, and Laboratory of Entomology who will be working on Wheat stem Sawfly. She arrived in January.

Brian Beres is working on his PhD supervised by Dean Spanner, Dept Agricultural, Food and Nutritional Sciences, U of A. His topic is Agronomic strategies to manage wheat stem sawfly

At the present time the University of Lethbridge and the Lethbridge Community College are not offering any courses in entomology. Bill Cade, President of the University of Lethbridge has announced he will be finished his second term in 2010 and will be stepping down as president. He does have a 2007-12 Natural Science and Engineering Research Council (NSERC) Research Grant to study Evolution of acoustical communication in insects. He has started a multi-year study on mating behaviour and genetic variation in field crickets. Kevin Judge is a postdoctoral fellow of Bill Cade's studying sexual selection, primarily using singing insects (e.g. crickets, katydids) as model organisms. Rob Laird is a new assistant professor at the University of

Lethbridge who is interested in insect-plant-fungus systems. The Lethbridge Community College has recently hired an entomologist, Jeremy Hummel.

An Ontario based NGO called Scientists in School came out to Lethbridge in June 2008 and spent a week presenting science topics to children in kindergarten to Grade 6. We had good support from the schools and teachers that participated. Diane Gladwell and Cindy Adams from the organization visited Lethbridge from October 19 to October 23. They held an open house about the program that was well attended by educators, parents and students. They presented a seminar at the Research centre which garnered a number of presenters for the program. The visit was very successful and they met with Administrators from the board outlining how the program will be introduced to Lethbridge. The first training will be in January and it is hoped that the kindergarten program can be started early in the new year. Their website is [www.scientistsinschool.ca](http://www.scientistsinschool.ca). They hired a fund raiser and have raised \$50,000 to date to help start the program.

The **Helen Schuler Coulee Centre** runs a number of programs throughout the year which deal with insects and spiders. This year they have planned one called Natural Olympians which will include some insects at the end of November. They are also planning a program on social insects in March and would like it if one of our members could help out. The special projects Coordinator, Becky Little, also suggested that we might be able to help them out with their booth at the Home and Garden show.

The Lethbridge Herald had a number of articles dealing with insects since November 2008. Since September 2008 there have been eleven articles.



## **2009 Webmaster's Report**

**Alec McClay**

I took over responsibility for maintenance of the Society's web pages on March 31, 2008. The site had recently been updated and there has been little to do. A request was received to link to an information page on the brown recluse spider, but on reviewing the site with some spider experts it was agreed that the site was not of suitable quality or relevance. A link was added to a spider page at the Royal Alberta Museum instead. Information on the 2008 Annual Meeting was posted as received. I am grateful to Troy Danyk for leaving the site in good order. There have been no problems with access to the site for uploading except after the Biological Sciences server failed on October 3, 2008. Kofi Garbrah provided instructions for accessing the new server and I was then able to upload files again.

Alec McClay  
Webmaster

November 6, 2008

## 2009 Secretary's Report Ken Fry

Report for the Period April 4 – November 5 2009

I received eleven (11) items in my capacity as ESA Secretary (all provided for examination to the Executive at this meeting):

1. Lethbridge Facility Update ..... December 18, 2008
2. 5/6 Lego League Coach..... January 7
3. COSEWIC Press Release..... May 4
4. WFPM Announcement..... May 11
5. Graeme Murphy Employment Notice ..... July 13
6. Andrew Heppner Insect Conservation ..... September 1
7. Orkin Link Request..... September 15
8. Ryan Burke Butterfly Research ..... September 17
9. U. of A. Reunion..... September 25
10. NHM Request ..... September 29
11. Carr Nomination ..... October 7

I retained fifty-five (55) discussions conducted via email:

I retained twenty-eight (28) copied messages.

As Secretary I issued twenty-one (21) notices to the membership:

1. Monarch notice Jan. 8
2. Strickland lecture announcement Feb. 17
3. Poster image request Mar. 27
4. Research opportunity Apr. 2
5. Notice of gmail account and solicitation of activities April 17
6. Insect collecting opportunity May 1
7. G. Giffiths passing May 15
8. Employment opportunity Jul 13
9. E. Mengersen passing Jul 23
10. COSEWIC Call for reports Oct 7
11. UofA employment opportunity Oct. 7
12. Paper submission solicitation Oct. 8
13. COSEWIC committee call Oct. 8
14. Arctic Biodiversity Oct. 15
15. Cricket request Oct. 23
16. Facebook Notice Nov. 3
17. Two (2) drafts of the Annual Meeting Announcement Sept. 10, Oct. 7
18. One (1) solicitation for student and other awards nominations Sept. 23
19. Registration form Oct. 8
20. Program availability Nov 4

Letters/items retained

1. Peter Harris letter of Honorary membership
2. ESA UG Award Certificate
3. Travel Grants to:
  - a. Marius
  - b. Jaime
  - c. Meghan
  - d. Emily
  - e. Boyd

Activities received:

Barb Beck for details of butterfly counts  
Athabasca butterfly count (details at [scienceoutreach.ca](http://scienceoutreach.ca))

## 2009 Interim Financial Report Kim Rondeau

Memberships:

|                      |                               |
|----------------------|-------------------------------|
| Total Memberships    |                               |
| Regular              | 95                            |
| Student              | 50                            |
| Honourary            | 6                             |
| Free Library         | 20                            |
| Subscription Library | 3 (the British one cancelled) |

New Members in 2009 (included in above totals)

|         |   |
|---------|---|
| Regular | 2 |
| Student | 0 |

Meeting Revenue:

|                       |    |            |
|-----------------------|----|------------|
| AGM Registrations     |    | \$2,750.00 |
| Total Registrations   | 39 |            |
| Students              | 18 |            |
| Retired               | 2  |            |
| Regular Members       | 19 |            |
| Extra banquet tickets | 4  |            |

Other Revenue to date:

|                     |           |
|---------------------|-----------|
| Investment Interest | \$ 417.50 |
| Membership renewals | \$ 40.00  |

Expenditures to date:

|                         |            |
|-------------------------|------------|
| AGM 2008                | \$8,383.72 |
| ESA Spring Exec Meeting | \$ 59.75   |
| Bank Charges            | \$ 14.25   |

**Current Balance (November 2, 2009):**

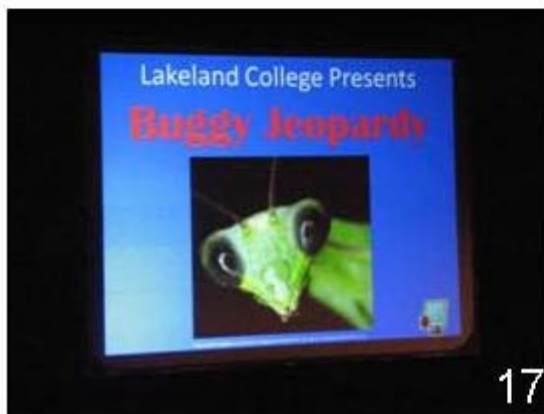
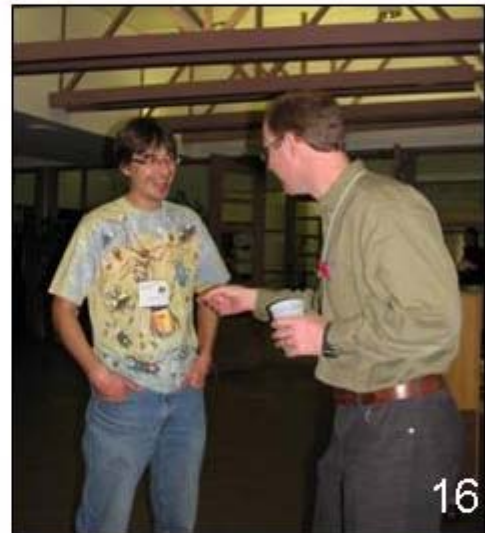
|               |                 |
|---------------|-----------------|
| Term Deposit  | \$15,000.00     |
| Chequing      | \$ 8,765.15     |
| Common Shares | \$ 550.13       |
| <br>Total     | <br>\$24,315.28 |



**Carr Award Winner 1:** Jan Scott and Rose De Clerck-Floate (past president) **Welcome Reception 2:** Lloyd Dossdall and Fran Leggett **3:** Ken Fry, Kevin Floate, and Alec McClay **4:** Kateryn Rochon and Felix Sperling **5:** Greg Pohl and Ken Fry **6:** Lorie Taylor Leech and Robin Leech



**Evening Reception 7:** Kay and George Ball **8:** Swaroop Kher and Peter Walsh **9:** Clara and Joe Shemanchuck **10:** Lloyd Dosedall, Brian Van Hezewijk, and Ken Fry register with Kim Rondeau and two students from Lakeland College, Vermillion **Break time 11:** Kateryn Rochon and Evan Esch **12:** Lloyd Dosedall and James Tansey



**Coffee Break 13:** Emily Barnewall, Meghan Vankosky, Amanda Van Haga, and Boyd Mori  
**14:** Meghan Vankosky, Hector Carcamo, and Xujiha Wu **15:** Swaroop Kher, Sunil Ranasinghe, and Felix Sperling **16:** Greg Phol and Brian Van Hezewijk **17:** Buggy Jeopardy  
**Banquet 18:** Emily Barnewall, Fran Leggett, Kim Rondeau, Brian Van Hezewijk, Stephane Bourassa, Seung-Il Lee, Jamie Pinzon, Peter Walsh, Mrs. Walsh, and Josie Van Lent (Associate Dean of Agricultural and Environmental Sciences of Lakeland College)



**Banquet 19:** After dinner speaker, Josie Van Lent (Associate Dean of Agriculture and Environmental Sciences of Lakeland College) **20:** After dinner speaker, Lester Parsons **21:** Student Travel Award Winners: Meghan Vankosky, Boyd Mori, Emily Barnewall, Rose De Clerck-Floate (past president), Marius Aurelian, and James Pinzon **22:** Undergraduate Award Winner, Boyd Mori and Rose De Clerck-Floate (past president) **23:** Kevin Floate, Ken Fry, Lloyd Dosedall, Jim Tansey, Brian Van Hezewijk, and Alec McClay **24:** U of A represents (Adam Blake, Julian Dupuis, Bryan Brunet, Jason Dombroski, Boyd Mori, Meghan Vankosky, and Benjamin Proshok (front)

**Photo Credits:** Rohin Leeche, Peter Walsh, Greg Pohl, and Emily Barnewall



## ESA Membership List

| Last                     | First       | Organization/Address   | City                                 | E-mail                          |
|--------------------------|-------------|--|--------------------------------------|---------------------------------|
| <b>Honourary Members</b> |             |  |                                      |                                 |
| Ball                     | George      | Dept. of Biological Sciences, University of Alberta <sup>11</sup>                    | Edmonton, AB                         | gball < ualberta.ca             |
| Byers                    | Bob         | AAFC, Lethbridge Research Station <sup>2</sup>                                       | Lethbridge, AB                       | j.robert.byers < agr.gc.ca      |
| Gurba                    | Joe         | 9415 - 144 St., Edmonton, AB T5R 0R8   |                                      |                                 |
| Gushul                   | Evan        | 323 - 785 Columbia Blvd. W, Lethbridge, AB T1K 4T8                                   |                                      | etgushul < telus.net            |
| Harris                   | Peter       | 245 Coachwood Pt. W, Lethbridge, AB T1K 6A3  |                                      | peter.harris < agr.gc.ca        |
| Larson                   | Ruby        | 410 20, 3 St. S, Lethbridge, AB T1K 4P1  |                                      |                                 |
| Shemanchuk               | Joseph      | 1050 Henderson Lake Blvd., Lethbridge, AB T1K 3B2                                    |                                      | joecla < telus.net              |
| <b>Regular Members</b>   |             |  |                                      |                                 |
| Acorn                    | John        |  |                                      | janature < compusmart.ab.ca     |
| Ball                     | Kay         | 8108 - 138 St., Edmonton, AB T5R 0C9   |                                      | keball < telusplanet.net        |
| Barr                     | William     | City of Edmonton   | Edmonton, AB                         |                                 |
| Battigelli               | Jeff        | Paragon Soil & Environmental Consulting Inc.<br>14805-119 Ave., Edmonton, AB T5L 2N9 | Edmonton, AB                         | jbattigelli < paragonsoil.com   |
| Bourassa                 | Stéphane    | Canadian Forest Service, Northern Forestry Centre <sup>9</sup>                       | Edmonton, AB                         | stbourassa < hotmail.com        |
| Brons                    | Gloria      | Butterfly Wings n' Wishes<br>43 Grand Meadow Cr., Edmonton, AB T6L 1A3               | Edmonton, AB                         | gloria < butterflyab.com        |
| Bryan                    | Nora        | 3307 12th Ave. SW, Calgary, AB, T3C 0S7  |                                      | altacal < yahoo.ca              |
| Byrtus                   | Gary        | 16531 - 114 St., Edmonton, AB, T5X 3V6   |                                      | gary.byrtus < gov.ab.ca         |
| Carcamo                  | Hector      | AAFC, Lethbridge Research Station <sup>2</sup>                                       | Lethbridge, AB                       | hector.carcamo < agr.gc.ca      |
| Cartar                   | Ralph       | Dept. Biological Sciences, U. of Calgary <sup>12</sup>                               | Calgary, AB                          | cartar < ucalgary.ca            |
| Clarkson                 | Christopher |  |                                      |                                 |
| Cobb                     | Tyler       | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                               | Edmonton, AB                         | tcobb < ualberta.ca             |
| Crowe                    | Michael     | Lakeland College <sup>16</sup>   | Vermilion, AB<br>Lloydminster,<br>AB | michael.crowe < lakelandc.ab.ca |
| Cuny                     | Robert      | Lakeland College <sup>15</sup>   |                                      | Robert.Cuny < lakelandc.ab.ca   |
| Davies                   | Milton      | #276 6005 Gateway Blvd., Edmonton, AB T6H 2G5  |                                      | milton.davies < arbor-pro.ca    |

|                 |                    |   |                |                                     |
|-----------------|--------------------|---|----------------|-------------------------------------|
| DeClerck-Floate | Rosemarie          | AAFC, Lethbridge Research Station <sup>2</sup>                              | Lethbridge, AB | rosemaire.declerck-floate<agr.gc.ca |
| Digweed         | Scott              | 3761 - 20 St. NW, Edmonton, AB T6T 1R8                                      |                | sdigweed < shaw.ca                  |
| Dosdall         | Lloyd              | Dept. of Agr., Food, and Nutritional Sci., U. of Alberta <sup>10</sup>      | Edmonton, AB   | lloyd.dosdall < ualberta.ca         |
| Erb             | Stephanie          | AAFC, Lethbridge Research Station <sup>2</sup>                              | Lethbridge, AB | stephanie.erb < agr.gc.ca           |
| Evenden         | Maya               | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                      | Edmonton, AB   | mevenden < ualberta.ca              |
| Feddes-Calpas   | Janet              |   |                |                                     |
| Floate          | Kevin              | AAFC, Lethbridge Research Station <sup>2</sup>                              | Lethbridge, AB | kevin.floate < agr.gc.ca            |
| Fry             | Ken                | Olds College <sup>17</sup>  | Olds, AB       | kfry < oldscollege.ca               |
| Goettel         | Mark               | AAFC, Lethbridge Research Station <sup>2</sup>                              | Lethbridge, AB | goettel < agr.gc.ca                 |
| Gooding         | Ronald             | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                      | Edmonton, AB   | ron.gooding < ualberta.ca           |
| Griffiths       | Graham             | P.O. Box 1380, Athabasca, AB T9S 2B2  |                | gcdgriff < telusplanet.net          |
| Heming          | Bruce              | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                      | Edmonton, AB   | bheming < ualberta.ca               |
| Heming          | Karin              | 10948 - 75 Ave., Edmonton, AB, T6G 0G9                                      |                |                                     |
| Hilchie         | Gerald             | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                      | Edmonton, AB   | gerald.hilchie < ualberta.ca        |
| Hindmarch       | Trevor             | 3409 Elbow Dr. SW, Calgary, AB T2S 2J5                                      |                | thindmarch < shaw.ca                |
| Holmberg        | Robert<br>Mohammad | Centre of Science, Athabasca University <sup>8</sup>                        | Athabasca, AB  | robert < athabascau.ca              |
| Hossain         | Babul              | 69 Tararidge Close NE, Calgary, AB T3J 2P5                                  |                | babulh < yahoo.com                  |
| Hundsdoerfer    | Anina              | Alberta Sustainable Resource Development <sup>5</sup>                       | Edmonton, AB   | anina.hundsdoerfer < gov.ab.ca      |
| Ivie            | Tyler              | Bayer Crop Science Inc.<br>Suite 100, 3131, 114 Ave. SE, Calgary AB T2Z 3X2 | Calgary, AB    | tyler.ivie < bayercropscience.com   |
| Johnson         | Elaine             | City of Red Deer  | Red Deer, AB   |                                     |
| Jones           | Jim                |   |                |                                     |
| Kanashiro       | Derrick            | AAFC, Lethbridge Research Station <sup>2</sup>                              | Lethbridge, AB | derrick.kanashiro < agr.gc.ca       |
| Katzell         | Susan              | City of Red Deer  | Red Deer, AB   |                                     |
| Kaufman         | Reuben             | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                      | Edmonton, AB   | reuben.kaufman < ualberta.ca        |
| Keddie          | Andrew             | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                      | Edmonton, AB   | akeddie < ualberta.ca               |
| Langor          | David              | Canadian Forest Service, Northern Forestry Centre <sup>9</sup>              | Edmonton, AB   | dlangor < nrcan.gc.ca               |
| Larson          | David              | Augustana University College <sup>7</sup>                                   | Camrose, AB    | david.larson < ualberta.ca          |

|              |          |  |                    |                               |
|--------------|----------|--|--------------------|-------------------------------|
| Leech        | Robin    | Alberta Society of Professional Biologists<br>10534 - 139 St., Edmonton AB T5N 2K7 |                    | releech < telusplanet.net     |
| Leggett      | Fran     | AAFC, Lethbridge Research Station <sup>2</sup>                                     | Lethbridge, AB     | frances.leggett < agr.gc.ca   |
| Lehman       | Ken      | City of Red Deer   | Red Deer, AB       | ken.lehman < reddeer.ca       |
| Longair      | Robert   | Dept. of Biological Sciences, U. of Calgary <sup>12</sup>                          | Calgary, AB        | longair < ucalgary.ca         |
| Lvie         | Tyler    |  |                    |                               |
| Mark         | Michelle | University of Alberta  | Edmonton, AB       | mm52 < ualberta.ca            |
| Maximchuk    | Mike     | Alberta Sustainable Resource Development   | Peace River,<br>AB | mike.maximchuk < gov.ab.ca    |
| McClay       | Alec     | McClay Ecoscience<br>15 Greenbriar Cr., Sherwood Park, AB T8H 1H8                  |                    | alec.mcclay < shaw.ca         |
| Otani        | Jennifer | AAFC, Beaverlodge Research Farm <sup>1</sup>                                       | Beaverlodge,<br>AB | jennifer.otani < agr.gc.ca    |
| Peterson     | Jason    | Simon Fraser University  | Burnaby, BC        | gandalf_strider < yahoo.com   |
| Phillips     | Iain     | Saskatchewan Watershed Authority <sup>18</sup>                                     | Saskatoon, SK      | iain.phillips < swa.ca        |
| Pohl         | Greg     | Canadian Forest Service, Northern Forestry Centre <sup>9</sup>                     | Edmonton, AB       | gpohl < nrcan.gc.ca           |
| Pritchard    | Gordon   | Dept. of Biological Sciences, U. of Calgary <sup>12</sup>                          | Calgary, AB        | gpritchard < ucalgary.ca      |
| Proctor      | Heather  | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                             | Edmonton, AB       | hproctor < ualberta.ca        |
| Rajput       | Sunil    | Alberta Research Council, Life Sciences Division <sup>4</sup>                      | Vegreville, AB     | sunil.rajput < arc.ab.ca      |
| Ranasinghe   | Sunil    | Alberta Sustainable Resource Development <sup>5</sup>                              | Edmonton, AB       | sunil.ranasinghe < gov.ab.ca  |
| Reid         | Mary     | Dept. of Biological Sciences, U. of Calgary <sup>12</sup>                          | Calgary, AB        | mreid < ucalgary.ca           |
| Rice         | Adrienne | Canadian Forest Service, Northern Forestry Centre <sup>9</sup>                     | Edmonton, AB       | arice < nrcan.gc.ca           |
| Rochon       | Kateryn  | AAFC, Lethbridge Research Station <sup>2</sup>                                     | Lethbridge, AB     | kateryn.rochon < agr.gc.ca    |
| Rondeau      | Kimberly | 1079 Francescutti Cr., Kelowna, BC V1W 3Y4   |                    | krondeau < gmail.com          |
| Saunders     | Chris    | City of Edmonton   | Edmonton, AB       |                               |
| Sharpe       | Andrea   | #203 10530 84 Ave., Edmonton, AB T6E 2H4   |                    | andreasharpe < hotmail.com    |
| Sperling     | Felix    | Dept. Biological Sciences, U. of Alberta <sup>11</sup>                             | Edmonton, AB       | Felix.Sperling < ualberta.ca  |
| Sperling     | Janet    | 9131 - 118 St., Edmonton, AB T6G 1T6   |                    |                               |
| Stevenson    | Margaret | City of Red Deer   | Red Deer, AB       |                               |
| Van Hezewijk | Brian    | AAFC, Lethbridge Research Station <sup>2</sup>                                     | Lethbridge, AB     | brain.vanhezewijk < agr.gc.ca |
| Veenstra     | Kevin    | City of St. Albert   | St. Albert, AB     |                               |
| Walsh        | Peter    | Lakeland College <sup>16</sup>   | Vermilion, AB      | peter.walsh < lakelandc.ab.ca |

|                   |               |  |                              |
|-------------------|---------------|--|------------------------------|
| Walter<br>Wheeler | Dave<br>Jenny | Dept. Biological Sciences, U. of Alberta <sup>11</sup><br>City of Edmonton | Edmonton, AB<br>Edmonton, AB |
|-------------------|---------------|--|------------------------------|

### Student Memberships

|             |             |   |                |                              |
|-------------|-------------|---|----------------|------------------------------|
| Barnewall   | Emily       | University of Lethbridge <sup>19</sup>                              | Lethbridge, AB | emily.barnewall < gmail.com  |
| Batista     | Philip      | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | pbatista < ualberta.ca       |
| Biliske     | Jennifer    | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | biliske < ualberta.ca        |
| Blake       | Adam        | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   |                              |
| Brunet      | Bryan       | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | bbrunet < ualberta.ca        |
| Dombroskie  | Jason       | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | dombrosk < ualberta.ca       |
| Dupuis      | Julian Rowe | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | jrdupuis < ualberta.ca       |
| Esch        | Evan        | Dept. Renewable Resources, U. of Alberta <sup>13</sup>              | Edmonton, AB   |                              |
| Foster      | Danusha     | Dept. of Biological Sciences, U. of Calgary <sup>12</sup>           | Calgary, AB    | djfoster < ucalgary.ca       |
| Gaberel     | Michelle    | Augustana University College <sup>7</sup>                           | Camrose, AB    | mgaberel < ualberta.ca       |
| Hummel      | Jeremy      | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | jhummel < ualberta.ca        |
| Kher        | Swaroop     | Dept. Agr., Food, and Nutritional Sci., U. of Alberta <sup>10</sup> | Edmonton, AB   | swaroopkher < gmail.com      |
| Lachowsky   | Leanna      | Dept. of Biological Sciences, U. of Calgary <sup>12</sup>           | Calgary, AB    | leanna.lachowsky < gmail.com |
| Lee         | Seung-II    | Dept. Renewable Resources, U. of Alberta <sup>13</sup>              | Edmonton, AB   | seungil.lee < ualberta.ca    |
| Lemmen      | Joelle      | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | jlemmen < ualberta.ca        |
| Lumley      | Lisa        | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | llumley < ualberta.ca        |
| MacQuarrie  | Chris       | Dept. Renewable Resources, U. of Alberta <sup>13</sup>              | Edmonton, AB   | cjm15 < ualberta.ca          |
| Miluch      | Christine   | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   |                              |
| Mousseau    | Tonya       | Dept. of Biological Sciences, U. of Calgary <sup>12</sup>           | Calgary, AB    | tmousseau < ucalgary.ca      |
| Newton      | Jeffrey     | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | jsnewton < ualberta.ca       |
| Pengelly    | Christian   | Dept. of Biological Sciences, U. of Calgary <sup>12</sup>           | Calgary, AB    | cjpengel < ucalgary.ca       |
| Proshek     | Benjamin    | Dept. Biological Sciences, U. of Alberta <sup>11</sup>              | Edmonton, AB   | proshek < ualberta.ca        |
| Subramaniam | Ravindran   | Dept. Agr., Food, and Nutritional Sci., U. of Alberta <sup>10</sup> | Edmonton, AB   |                              |
| Tansey      | James       | Dept. Agr., Food, and Nutritional Sci., U. of Alberta <sup>10</sup> | Edmonton, AB   | jtansey < ualberta.ca        |

|             |          |  |                |                        |
|-------------|----------|--|----------------|------------------------|
| Van Haga    | Amanda   | University of Alberta                                  | Edmonton, AB   | vanhagaa < gmail.com   |
| Vankosky    | Meghan   | University of Alberta                                  | Edmonton, AB   |                        |
| Waller      | Jennifer | University of Alberta                                  | Edmonton, AB   | jwaller < ualberta.ca  |
| Whitehouse  | Caroline | University of Alberta                                  | Edmonton, AB   | cmw7 < ualberta.ca     |
| Wist        | Tyler    | Dept. Biological Sciences, U. of Alberta <sup>11</sup> | Edmonton, AB   | wist < ualberta.ca     |
| Wood        | Charlene | Dept. Renewable Resources, U. of Alberta <sup>13</sup> | Edmonton, AB   |                        |
| Wu          | Xiuhua   | AAFC, Lethbridge Research Station <sup>2</sup>         | Lethbridge, AB | xiuhua.wu < agr.gc.ca  |
| Schwarzfeld | Marla    | Dept. Biological Sciences, U. of Alberta <sup>11</sup> | Edmonton, AB   | schwarzf < ualberta.ca |

**Contact information for institutions listed above:**

|    |   |  |
|----|---|--|
| 1  | AFFC, Beaverlodge Research Farm                       | P.O. Box 29, Beaverlodge, AB T0H 0C0                           |
| 2  | AFFC, Lethbridge Research Centre                      | P.O. Box 3000, Lethbridge, AB T1J 4B1                          |
| 3  | AAFC, Saskatoon Research Centre                       | 107 Science Place, Saskatoon, SK S7N 0X2                       |
| 4  | Alberta Research Council Life Sciences Division       | Highway 16A - 75 St., Vegreville, AB T9C 1T4                   |
| 5  | Alberta Sustainable Resource Development              | 8th Floor GWI Building, 9920 108 St., Edmonton, AB T5K 2M4     |
| 6  | Alberta Sustainable Resource Development              | Bag 900-04, Peace River, AB T8S 1T4                            |
| 7  | Augustana University College                          | 4901-46 Ave., Camrose, AB T4V 2R3                              |
| 8  | Centre of Science, Athabasca University               | 1 University Dr., Athabasca, AB T9S 3A3                        |
| 9  | CFS, Northern Forestry Centre                         | 5320 - 122 St., Edmonton, AB T6H 3S5                           |
| 10 | Dept. Agr., Food, and Nutritional Sci., U. of Alberta | Agriculture-Forestry Centre, Univ. of AB, Edmonton, AB T6G 2P5 |
| 11 | Dept. Biological Sciences, U. of Alberta              | CW405 Biosciences Bldg., Univ. of AB, Edmonton, AB T6G 2E9     |
| 12 | Dept. Biological Sciences, U. of Calgary              | 2500 University Dr. NW, Calgary, AB, T2N 1N4                   |
| 13 | Dept. Renewable Resources, U. of Alberta              | 442 Earth Sciences Bldg., Univ. of AB, Edmonton, AB T6G 2E1    |
| 14 | Grand Prairie Regional College                        | 10726 - 106 Ave., Grande Prairie, AB T8V 4C4                   |
| 15 | Lakeland College                                      | Bag 6000, 2602 - 59 Ave., Lloydminster, AB T9V 1Z3             |
| 16 | Lakeland College                                      | 5707- 47 Ave. West, Vermilion, AB T9X 1K5                      |
| 17 | Olds College  | 4500 - 50 St., Olds, AB T4H 1R6                                |
| 18 | Saskatchewan Watershed Authority                      | 330 - 350 Third Avenue North, Saskatoon, Sk S7K 2H             |
| 19 | University of Lethbridge                              | 4401 University Drive, Lethbridge, AB T1K 3M4                  |

**Free Library Subscriptions**

|   |   |
|---|---|
| AAFC Lethbridge Research Centre Library   | P.O. Box 3000, Lethbridge, AB, T1J 4B1                              |
| Athabasca University College Library      | 1 University Drive, Athabasca, AB, T9S 3A3                          |
| Augustana University College Library      | 4901 - 46 Ave., Camrose, AB, T4V 2R3                                |
| CFS Northern Forestry Centre Library      | 5320 - 122 St., Edmonton, AB, T6H 3S5                               |
| Concordia University College Library      | 7128 - Ada Blvd., Edmonton, AB, T5B 4E4                             |
| Glenbow Alberta Institute                 | 130 - 9th Ave. SE, Calgary, AB, T2G 0P3                             |
| Grande Prairie Regional College Library   | 10726 - 106 Ave., Grande Prairie, AB, T8V 4C4                       |
| Lakeland College Library                  | 5707 - 47 Ave. West, Vermilion, AB, T9X 1K5                         |
| Medicine Hat College Library              | 299 College Dr. SE, Medicine Hat, AB, T1A 3Y6                       |
| N.A.I.T. Library                          | 11762 - 106 St., Edmonton, AB, T5G 2R1                              |
| National Library of Canada                | 395 Wellington St., Ottawa, ON, K1A 0N4                             |
| Olds College Library                      | 4500 - 50 St., Olds, AB, T4H 1R6                                    |
| Royal Alberta Museum                      | 12845 102 Ave., Edmonton, AB, T5N 0M6                               |
| Red Deer College Library                  | Box 5005, Red Deer, AB, T4N 5H5                                     |
| S.A.I.T. Library                          | 1301 - 16 Ave. NW, Calgary, AB, T2M 0L4                             |
| University of Alberta, Cameron Library    | 5th floor, Periodicals, University of Alberta, Edmonton, AB, T5G 2E |
| University of Alberta, Strickland Library | Earth Sciences Bldg. University of Alberta, Edmonton, AB, T5G 2E3   |
| University of Calgary Library             | Library, 2500 University Dr. NW, Calgary, AB, T2N 1N4               |
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## **The Entomological Society of Alberta**

The Entomological Society of Alberta was organized November 27, 1952, at a meeting held in Lethbridge, Alberta, as an affiliate of the Entomological Society of Canada. A certificate of incorporation was obtained under the Societies Act of Alberta on February 19, 1953.

The membership of about 70 paid-up members at that time consisted mainly of Dominion (Federal) entomologists at the Science Service Laboratories in Lethbridge (now an Agriculture and Agri-Food Canada Research Station), the Suffield Research Station, the Forest Zoology Laboratory in Calgary, and students and staff from the University of Alberta.

The object of the Entomological Society of Alberta (ESAB) shall be to foster the advancement, exchange, and dissemination of the knowledge of insects in relation to their importance in agriculture, horticulture, forestry, public health, industry, the environment, and for its own sake, among the people of the province of Alberta.

Membership is open to anyone interested in Entomology. Annual dues at \$20.00 (\$10.00 for students). Contact the Treasurer via the society website:

<http://www.entsocalberta.ca/esa.htm>

